

## VII. SOUTH AMERICAN TETRIGIDÆ.

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Some time ago the extensive collection of saltatorial Orthoptera made by Mr. H. H. Smith in Brazil and adjoining parts of South America was placed in my hands by Dr. W. J. Holland, the Director of the Carnegie Museum, for study. Among the material thus submitted are many representatives of the family of "grouse-locusts." In fact, the collection contains such a large percentage of the described species of South America and at least a score of new ones, that the writer has decided to make this report a review of the family so far as South American forms are concerned.

While in nowise a monograph or even synopsis of the group, the paper gives brief synopses of the subfamilies and genera, lists all the species, and in many instances also adds synoptic tables for the separation of the species of the larger genera. Of course all new forms are quite fully characterized. The arrangement of the subfamilies, genera, and species is intended to convey, as far as possible, the author's opinion as to the proper sequence of the various forms. An occasional reference is also made to some feature in connection with the life-history or distribution of certain forms with the hope that it may add something to our general knowledge of these interesting little locusts.

It might be added that the majority of the representatives of the family are to a great degree either aquatic or semi-aquatic in their habits. Hence they should be sought for at the margins of streams and bodies of water, or in very humid localities, rather than in arid places. A few of them live among the mosses and lichens which grow on trunks of trees and rocks, to which their general color conforms to such an extent as to be strongly protective.

### TABLE FOR THE SEPARATION OF THE SUBFAMILIES AND GENERA OF SOUTH AMERICAN TETRIGIDÆ.

A. Frontal costa widely forked, the rami forming a frontal scutellum.

CLADINOTINÆ.

b. Pronotum very greatly compressed, above wholly foliaceous.

c. Pronotum viewed in profile subrhombic-angulate, ampliate posteriorly; first and third joints of the posterior tarsi subequal, or the first slightly longer.

*Phyllolettix* Hancock.

- cc. Pronotum with the dorsum very greatly compressed, above angulato-  
rounded, posteriorly truncate; first article of the posterior tarsi a little  
longer than the third . . . . . *Choriphyllum* Serville.
- bb. Pronotum little or slightly compressed, very often depressed, or above not  
wholly foliaceous, or to a certain degree anteriorly compresso-produced.
- c. First and third joints of the hind tarsi subequal in length. Body nearly  
smooth; pronotum acute tectiform, in profile arcuate, posteriorly little  
depressed, the apex widely rounded. . . . . *Eleleus* Bolivar.
- cc. First joint of the hind tarsi longer than the third. Pronotum nodulose,  
middle distinctly depressed; the vertex strongly produced in advance  
of the eyes . . . . . *Cota* Bolivar.
- AA. The frontal costa furcillate, but the rami diverging only gently forward, or  
remaining parallel, very frequently separated only in a slight degree by a  
sulcus.
- b. Posterior angles of the lateral lobes of the pronotum but little produced out-  
wards, obliquely truncate behind, very rarely acute spinose; first and  
third joints of the hind tarsi nearly equal in length. . . . . *METRODORINÆ*.
- c. Vertex truncate, the middle rarely provided with a produced central tooth.
- d. Vertex very narrow, about half the width of one of the eyes; posterior  
angles of the lateral lobes of the pronotum flattened outwards, trian-  
gularly produced, subspiniform or uncinatè. . . . . *Plesiotettix* Hancock.
- dd. Vertex subequal to, or wider than, one of the eyes.
- e. Antennæ inserted between the lower part of the eyes. Vertex not pro-  
duced in advance of the eyes; the frontal costa roundly elevated  
between the antennæ . . . . . *Cotys* Bolivar.
- ee. Antennæ situated below or rarely on a level with the inferior margin  
of the eyes.
- f. Body strongly depressed; anterior and middle femora expanded or  
clypeate, the carinæ sinuato-lobate or foliaceo-laminate.
- g. Tegmina and wings wanting. Antennæ inserted on a level with  
the lower margins of the eyes; first joint of the hind tarsi  
longer than the third . . . . . *Platythorus* Hancock.
- gg. Tegmina and wings present.
- h. Anterior femora clypeate. Lateral ocelli placed between the  
inferior part of the eyes. Antennæ shorter than the head  
and inserted distinctly below the eyes. . . . . *Amorphopus* Serville.
- hh. Anterior femora not at all clypeate. Lateral ocelli placed  
between the middle of the eyes. Antennæ longer than the  
head and inserted on a line with the inferior margin of the  
eyes . . . . . *Eomorphopus* Hancock.
- ff. Body little depressed, or dorsum bearing gibbosities, or the median  
carina of the pronotum more or less cristulate-undulate.
- g. Posterior or lateral ocelli placed below the eyes. . . . . *Chiriquia* Morse.
- gg. Posterior or lateral ocelli placed distinctly between the eyes,  
h. Dorsum longitudinally compresso-elevated forward, flattened  
posteriorly, rugose-reticulose, apex of process acute. Teg-  
mina and wings wanting . . . . . *Platyttix* Hancock.

lh. Dorsum somewhat depressed.

i. Median carina of the pronotum compresso-elevated between the shoulders; the vertex very wide, transverse, fully twice the width of one of the eyes. . . *Gladiolettix* Hancock.

ii. Median carina of the pronotum not compresso-elevated between the shoulders; the vertex narrower, but little, if any, wider than one of the eyes.

j. Middle femora about one-half as wide as long.

k. Stature very small . . . . . *Crimisus* Bolivar.

kk. Stature medium, or larger. Pronotum with the median carina interrupted or undulate . . . *Sclerotettix* Bruner.

jj. Middle femora much longer than wide.

k. Vertex with the median carina distinctly produced in advance of the eyes; posterior angles of the lateral lobes of the pronotum outwardly flattened, somewhat acute; body without tegmina or wings.

*Metrodora* Bolivar.

kk. Vertex with the median carina not at all produced beyond the eyes.

l. Posterior ocelli placed between the inferior part of the eyes.

m. Posterior femora of normal form. First and third joints of hind tarsi of equal length.

*Otumba* Morse.

mm. Posterior femora triquetrous, the genicular spine triangular, strongly elevated, produced.

*Trigonofemora* Hancock.

ll. Posterior ocelli placed near the middle of the eyes.

m. Lower posterior angles of sides of pronotum little flattened outwards and angulate, truncate behind, or acutely produced but not at all spined. Body rugose . . . *Scabrotettix* Hancock.

mm. Lower posterior angles of sides of pronotum turned down, not at all obliquely truncate. Body subrugose . . . . . *Allotettix* Hancock.

cc. Vertex acute and lengthily produced in advance of the eyes, armed on each side with one or two denticles . . . . . *Mitritettix* Hancock.

bb. Posterior angles of the lateral lobes of the pronotum turned down, more or less rounded, not at all obliquely truncate; third joint of the hind tarsi shorter than the first.

c. Anterior and middle femora carinate above; pronotum truncate anteriorly, rarely angulately produced. Antennæ fewer jointed . . . TETRIGINÆ.

d. Vertex strongly narrowed forward, drawing the eyes very near together anteriorly. The pronotum subcylindrical, smoothly granulate, the carinæ very low or flattened . . . . . *Teredorus* Hancock.

dd. Vertex somewhat narrowed toward the front but the anterior border truncate, about one-half to quite the breadth of one of the eyes or even a little more.

- e. Middle femoral margins strongly carinate-clypeate, their length a little more than the breadth. Head very short, somewhat retracted under the pronotum. . . . . *Clypeotettix* Hancock.
- ee. Middle femoral margins not clypeate, but sometimes the carinae are compressed but then the length is much more than the breadth.
- f. Vertex truncate, not advanced beyond the eyes, narrower or subequal to one of them; dorsum advanced upon the head to the eyes.  
*Paratettix* Bolivar.
- ff. Vertex produced beyond the eyes, usually wider than one of them, in profile very often angulately produced. . . . . *Tetrix* Latreille.
- g. Antennæ inserted between the inferior part of the eyes. Body somewhat rugose, slender prolonged; dorsum subdepressed, very narrow between the shoulders. . . . . *Stenoderus* Hancock.
- gg. Antennæ inserted little below the eyes.
- h. Body usually abbreviated, comparatively robust, the median carina of the pronotum cristulato-undulate, the anterior margin truncate; wings often imperfectly developed, rarely macropterous; antennæ filamentous, elongate.  
*Micronotus* Bolivar.
- hh. Body having the surface of the dorsum rugose or tuberculose. Antennæ short and stout.
- i. Hind tibiæ normal, pleurispinose. Wings perfectly explicate, passing the apex of the hind femora.  
*Apotettix* Hancock.
- ii. Hind tibiæ distinctly ampliate towards the apex, lightly spinose. Wings not longer than the pronotum or somewhat abbreviate. . . . . *Protettix* Bolivar.
- cc. Anterior usually and middle femora above always distinctly sulcate. Pronotum anteriorly more or less produced above the head, often uncinatè or acuminate or to a certain degree obtusangulate. Antennæ with sixteen to twenty-two joints . . . . . BATRACHIDIINÆ.
- d. Vertex anteriorly distinctly carinate disposed obliquely or transversely, middle carinate, more or less compressed, produced.
- e. Pronotum with the posterior angles of the lateral lobes turned down; elytral sinus and elytra normal.
- f. Top of head between the eyes more or less longitudinally convex and provided in front with a rather prominent median carina; the vertex viewed in profile advanced but little in front of the eyes.  
*Tettigidea* Scudder.
- ff. Top of head between the eyes rather widely longitudinally sulcate, the anterior portion also provided with a median carina of varying prominence; vertex viewed in profile considerably advanced in front of the eyes as in the genus *Tetrix*.
- g. Anterior femora very faintly sulcate; middle of vertex provided with a minute carina, the frontal costa narrowly sulcate between the ocelli and below. Antennæ long and slender, 21- or 22-jointed. Valves of the ovipositor short and somewhat robust. . . . . *Lophotettix* Bruner.

- gg. Upper edge of the anterior femora plainly sulcate; the anterior middle of vertex provided with a very prominent carina, the frontal costa quite widely sulcate to the summit. Antennæ rather short, slender and composed of 15 or 16 joints. Valves of the ovipositor very long and slender. . . . *Lophoscirtus* Bruner.
- ee. Pronotum with the posterior angles of the lateral lobes turned a little outwards.
- f. Elytral sinus subobsolete, tegmina present but minute. Body scabrous. . . . . *Plectronotus* Morse.
- ff. Elytral sinus altogether wanting, tegmina as well as the wings absent. Body granulose . . . . . *Apteropodon* Bruner.
- dd. Vertex anteriorly not or imperfectly carinate, each side bearing small abbreviated lobes next to the eyes, or tumid, median carina wanting, or when present the facial costa roundly produced.
- e. Frontal costa very narrowly sulcate.
- f. Body slender; pronotum lengthily subulate, median carina distinctly ascendent forward near the anterior margin. . . . *Scaria* Bolivar.
- ff. Body somewhat grosser; pronotum having the median carina viewed in profile horizontal, posterior process and wings dimorphic in length. . . . . *Batrachidea* Serville.
- ee. Frontal costa widely sulcate.
- f. Pronotum anteriorly truncate; first joint of the posterior tarsi strongly elongate—twice the length of the third; frontal costa roundly produced . . . . . *Paurotarsus* Hancock.
- ff. Pronotum anteriorly acute uncinately; tarsal joints normal.

*Puiggaria* Bolivar.

Subfamily CLADONOTINÆ.

Genus PHYLLOTETTIX Hancock.

*Phyllotettix* HANCOCK, Ent. News, XIII, June, 1902, 188.

*Phyllonotus* HANCOCK, Tettigidæ of N. Am., 1902, 45.

The various representatives of the present genus appear to be confined wholly to the West Indies.

SYNOPSIS OF THE SPECIES OF PHYLLOTETTIX.

- A. Superior marginal carina of the hind femora lobate. . . . . *westwoodi* Hancock.
- AA. Superior marginal carina of the hind femora not lobate.
- b. Pronotum viewed in profile distinctly enlarged posteriorly. Body larger. . . . . *foliatus* Hancock.
- bb. Pronotum viewed in profile only subenlarged posteriorly. Body small. . . . . *rhombus* Baker.

*Phyllotettix foliatus* Hancock.

*Coriphylum foliatum* HANCOCK, Tettigidæ of N. Am., 1902, 42-43, pl. 1, fig. 1.

*Phyllotettix foliatus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 12.

*Habitat*.—This very odd appearing locust is found on the island of Jamaica in the West Indies. These islands are usually included with

South America rather than with the faunal areas of adjoining portions of North America.

**Phyllotettix westwoodi** Hancock.

*Choriphyllum westwoodi* HANCOCK, Tettigidæ of N. Am., 1902, 42, pl. 1, fig. 2.

*Phyllotettix westwoodi* HANCOCK, Genera Insectorum, fasc. 48, 1906, 12.

*Habitat.*—Like the preceding, this insect comes from the island of Jamaica.

As indicated by Hancock in the table given on page 42 of his Tettigidæ of North America the present species is separable from the other two forms by the lobate upper carina of the hind femora.

**Phyllotettix rhombeus** (Baker).

*Cicada rhombea* BAKER, Trans. Linn. Soc. Lond., LIV, 1764, 55, pl. 6.

*Membracis rhombea* LINN., Syst. Nat., ed. 12, I, 1767, 704.

*Acridium (Hymenotes) rhombeum* DE HANN, Bijdr., 1842, 165, pl. 12, fig. 11.

*Choriphyllum rhombeum* WALKER, Cat. Derm. Salt. Brit. Mus., V, 1871, 845.

*Phyllotettix rhombeus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 12.

*Habitat.*—Jamaica and Cuba, West Indies.

Genus **CHORIPHYLLUM** Serville.

*Choriphyllum* SERVILLE, Hist. Nat. Ins. Orthopt., 1839, 754.

*Hymenotes* STÅL.

*Chorophyllum* FIEBER.

This genus, like the preceding, is confined in its distribution to the West Indies.

SYNOPSIS OF THE SPECIES OF CHORIPHYLLUM.

- A. The leaf-like median carina of the pronotum highest over the head.  
*sagrai* Serville.
- AA. The leaf-like median carina of the pronotum most prominent near its middle.  
 b. Body small (♀, 7 mm.); the highest point of the pronotum at the middle.  
*saussurei* Bolivar.
- bb. Body larger (♀, 10 mm.); the highest point of the pronotum a little back of the middle . . . . . *plagiatum* Walker.

**Choriphyllum sagrai** Serville.

*Chorophyllum sagrai* SERVILLE, Hist. Nat. Ins. Orthopt., 1839, 755, pl. 8, fig. 5.—

HANCOCK, Genera Insectorum, fasc. 48, 1906, 18.

*Habitat.*—This species has been recorded only from the island of Cuba, West Indies.

**Choriphyllum plagiatum** Walker.

*Choriphyllum plagiatum* WALKER, Cat. Dermapt. Salt. Brit. Mus., V, 1871, 845.

—HANCOCK, Genera Insectorum, fasc. 48, 1906, 13.

*Habitat.*—West Indies, the island of Jamaica.

**Choriphyllum saussurei** Bolivar.

*Choriphyllum saussurei* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 203, pl. 1, fig. 5.—HANCOCK, Genera Insectorum, fasc. 48, 1906, pl. 1, fig. 7.

*Habitat*.—Like the preceding this insect comes from the island of Jamaica, West Indies.

**Genus ELELEUS** Bolivar.

*Eleleus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 205.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 16.

**Eleleus curtus** Bolivar.

*Eleleus curtus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 206, pl. 1, figs. 7-7a, b.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 16, pl. 1, fig. 7.

*Habitat*.—This insect is recorded only from Brazil. No specimens are at hand.

**Genus COTA** Bolivar.

*Cota* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 32.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 18.

## SYNOPSIS OF THE SPECIES OF COTA.

- A. Anterior and middle femora strongly undulately carinate.  
 b. Lateral lobes of the vertex rounded . . . . . *strumosa* Bolivar.  
 bb. Lateral lobes of the vertex acute . . . . . *saxosa* Bolivar.  
 AA. Anterior and middle femora with the carinæ weakly undulate.  
*bispina* Saussure.

**Cota strumosa** Bolivar.

*Cota strumosa* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 206.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 18.

*Habitat*.—According to Bolivar this insect comes from the Upper Amazon. The present collection contains specimens bearing the labels "Benevides, July." Carnegie Museum, Pittsburgh.

**Cota saxosa** Bolivar.

*Cota saxosa* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 207, pl. 1, figs. 8, 8a.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 18, pl. 1, fig. 13.

*Habitat*.—Given by Bolivar as Peru. Not contained in the present collection.

? **Cota bispina** (Saussure).

*Tettix bispina* SAUSSURE, Orthopt. Nov. Am., ser. 2, 1861, 32.

? *Cota bispina* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 207.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 18.

*Habitat*.—Bahia, Brazil. Not in the collection now being reported upon.

Subfamily *METRODORINÆ*.Genus *PLESIOTETTIX* Hancock.

*Plesiotettix* HANCOCK, Genera Insectorum, fasc. 48, 1906, 34.

The two species of this genus are very similar but may be separated as follows:

A. Front end of the pronotum just back of the margin a little upturned.

*uncinatus* Hancock.

AA. Front end of the pronotum just back of the margin not so upturned.

*spinosa* Hancock.

***Plesiotettix uncinatus* Hancock.**

*Plesiotettix uncinatus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 34, pl. 3, fig. 22.

*Habitat*.—Pachitea, Peru. Not contained in the material studied.

***Plesiotettix spinosus* Hancock.**

*Plesiotettix spinosus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 34.

*Habitat*.—Marcapata, Peru.

This second species differs from the preceding in being decidedly smaller and in not having the lower posterior lateral angles of the pronotum hooked or curved forwards. It too is missing from the Smith collection.

Genus *COTYS* Bolivar.

*Cotys* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 247.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 35.

***Cotys antennatus* Bolivar.**

*Cotys antennatus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 247.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 35, pl. 4, fig. 34.

*Habitat*.—Peru, S. America.

Genus *PLATYTHORUS* Morse.

*Platythorus* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 8.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 36.

***Platythorus camurus* Morse.**

*Platythorus camurus* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 8.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 36.

*Habitat*.—Nicaragua and Costa Rica, where it is to be met with on the trunks of trees, among lichens and mosses, the colors of which it imitates to a remarkable degree. The writer has collected it in the vicinity of Juan Viñas at an altitude of between 2,500 and 3,000 feet above sea-level. There is but little doubt of its occurring also in the adjoining northern portions of South America.



## Genus AMORPHOPUS Serville.

*Amorphopus* SERVILLE, Hist. Nat. Ins. Orthopt., 1839, 756.—BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 250, *part.*—HANCOCK, Genera Insectorum, fasc. 48, 1906, 36-37.

The species of this genus as at present restricted are at home in the Neotropical region of America. Four or five forms are recognized. They may be separated by the subjoined table.

## SYNOPSIS OF THE SPECIES OF AMORPHOPUS.

- A. Posterior extremity of the pronotum attenuate, considerably surpassing the apex of the abdomen and tips of the hind femora.
- b. Size smaller (♀, 13-14 mm.).
- c. Dorsum of the pronotum grayish, smooth; the median carina of the pronotum back of the humeri somewhat compressed. . . . . *griseus* Bolivar.
- cc. Dorsum of the pronotum fusco-variegated, rugulose, the median carina not sinuose. . . . . *notabilis* Serville.
- bb. Size larger (♀, 15.5-16 mm.).
- c. Color above fuscous interspersed with white. . . . . *cnemidotus* Burmeister.
- cc. Color above grayish, tessellated with fuscous. . . . . *caïman* Saussure.
- AA. Posterior extremity of pronotum not extending beyond the tip of the abdomen. Tegmina and wings hidden or aborted. . . . . *testudo* Saussure.

***Amorphopus griseus* Bolivar.**

*Amorphopus griseus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 251-252.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 37.

*Habitat.*—Upper Amazon, South America.

***Amorphopus notabilis* Serville.**

*Amorphopus notabilis* SERVILLE, Hist. Nat. Ins. Orthopt., 1839, 757, pl. 2, figs. 20, 20a-b.—BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 252.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 37, pl. 4, fig. 38.

*Habitat.*—This insect has been recorded from Brazil, Peru, Bolivia, Venezuela, Guiana, and the island of Trinidad. The present collection contains specimens taken at Para and Benevides, Brazil, during the months of June and July. Collection Carnegie Museum, Pittsburgh.

***Amorphopus cnemidotus* Burmeister.**

*Tetrix cnemidotus* BURMEISTER, Handb. Ent., II, 1838, 650.

*Paratettix cnemidotus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 274.—GIGLIOTTOS, Boll. Mus. Zool. Anat. Comp. Torino, XII, no. 302, 1897, 28.

*Amorphopus cnemidotus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 37.

*Habitat.*—Brazil.

***Amorphopus caïman* Saussure.**

*Amorphopus caïman* SAUSSURE, Orthopt. Nov. Am., ser. 2, 1861, 33.

*Habitat.*—Brazil.

Whether or not this and the preceding species are distinct is uncertain until a number of specimens from various parts of South America are critically studied.

**Amorphopus testudo** Saussure.

*Amorphopus testudo* SAUSSURE, Orthopt. Nov. Am., ser. 2, 1861, 32.

*Habitat*.—Guiana, S. America.

Genus **EOMORPHOPUS** Hancock.

*Eomorphopus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 37.

The species of this genus are confined to South America. They may be separated as follows:

A. Dorsum of the pronotum rugulose; anterior femora above biundulate.  
*antennatus* Bolivar.

AA. Dorsum of the pronotum nearly smooth granulate; the anterior femora strongly carinate, above triundulate.....*granulatus* Hancock.

**Eomorhopus antennatus** (Bolivar).

*Amorphopus antennatus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 251, pl. 2, figs. 19, 19a-b.

*Eomorphopus antennatus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 38.

*Habitat*.—This insect is credited to the Upper Amazon by Bolivar and Hancock. The Smith collection contains specimens taken at Chapada, near Cuyaba, Matto Grosso, Brazil. Collection Carnegie Museum, Pittsburgh. There are specimens in the writer's collection which were taken on the island of Trinidad.

**Eomorphopus granulatus** Hancock.

*Eomorphopus granulatus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 38, pl. 4, figs. 35, 35a.

*Habitat*.—Dutch Guiana, South America. The present collection also contains specimens taken at Benevides and Santarem, Brazil. Collection Carnegie Museum, Pittsburgh.

This last species may be recognized from *antennatus* by its much smoother body and slightly slenderer form.

Genus **CHIRIQUIA** Morse.

*Chiriquia* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 7.—HANCOCK, Tettigidae N. Am., 1902, 49; Genera Insectorum, fasc. 48, 1906, 39.

The two species of the genus are confined to the extreme southern parts of North America and to South America. They may be distinguished as follows:

- A. Posterior lateral lobes of the pronotum lamellate, squarely truncate at the apex; the median carina strongly undulate for two-thirds of its length.  
*serrata* Morse.
- AA. Posterior lateral lobes of the pronotum with their apex acutely produced; the median carina in front bicristate. . . . . *concinna* Bolivar.

**Chiriquia serrata** Morse.

*Chiriquia serrata* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 7.

*Habitat*.—This insect has been recorded from Nicaragua, Costa Rica and Panama in North America. There is no doubt in the writer's mind but that its distribution also extends into South American territory as well.

**Chiriquia concinna** (Bolivar).

*Metradora concinna* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 249.

*Chiriquia concinna* HANCOCK, Genera Insectorum, fasc. 48, 1906, 39.

*Habitat*.—Recorded heretofore from Paramaribo, Dutch Guiana and Peru. Represented by a single specimen in the present collection coming from Para, Brazil. Collection Carnegie Museum, Pittsburgh.

Genus **PLATYTETTIX** Hancock.

*Platytettix* HANCOCK, Ent. News, XVII, 1906, 88; Genera Insectorum, fasc. 48, 1906, 39.

Three species of the genus *Platytettix* at least have come to light thus far. They may be separated in this manner:

- A. Larger (8-9 mm.). Pronotum strongly reticulate and gibbous.
- b. Apex of the anterior edge of the posterior lateral lobes of the pronotum greatly produced and acuminate. . . . . *reticulatus* Hancock.
- bb. Apex of the posterior lateral lobes but little produced . . . *gibbinotus* sp. nov.
- AA. Smaller (7 mm.). Pronotum comparatively smooth. Posterior angles of the pronotum roundly angulate. . . . . *uniformis* sp. nov.

**Platytettix reticulatus** Hancock.

*Platytettix reticulatus* HANCOCK, Ent. News, XVII, 1906, 88-89; Genera Insectorum, fasc. 48, 1906, 40, pl. 3, figs. 23, 23a.

*Habitat*.—Peru.

**Platytettix gibbinotus** sp. nov.

Very similar to *P. reticulatus* Hancock, but somewhat smaller, and with the lower posterior angles of the pronotum shorter and less acute. It also differs from that species in having the upper and lower carinæ of the anterior femora quite differently lobate than shown in Hancock's figure (*vide* Genera Insectorum, fasc. 48, pl. 3, fig. 23) the upper one being scarcely lobate, while the lower is strongly developed into two acute



lobes which occupy the middle third, the outer or apical lobe being twice as prominent as the basal one. The first joint of the posterior tarsi is distinctly longer than the third. The general color of the present series is dark fusco-ferruginous, with the apical joints of the antennæ testaceous.

Length of body, ♂, 7.5 mm., ♀, 8 mm.; of pronotum, ♂ and ♀, 7.55 mm.; of hind femora, ♂, 4.5 mm., ♀, 4.85 mm.; length to tip of pronotum, ♂, 8.5 mm., ♀, 8 mm.

*Habitat*.—One male and one female, Para, Brazil, taken in August by H. H. Smith. The collection also contains what is apparently a nymph of this same species from Benevides, Brazil, collected in July. Collection Carnegie Museum, Pittsburgh.

The dorsum of the pronotum back of the humeral gibbosity is rounded in the female but flattened in the male.

#### ***Platy tettix uniformis* sp. nov.**

Considerably smaller than the preceding species and *P. reticulatus* Hancock, from both of which it differs in the non- or less strongly reticulate and less gibbous pronotum, and in having the lower posterior angles of the pronotum roundly angulate instead of acute. The carinæ of the anterior and middle femora, while prominent, are not undulate above and scarcely lobate below, but notched so as to produce an acute tooth in advance of the apex. Head small, the eyes separated above by a space greater than the diameter of one of them. The vertex is slightly advanced in front of the eyes, where the upper extremity of the frontal costa is quite prominent and when viewed from above appears as an acute median anteriorly projecting tooth; the space between the eyes above is provided in the middle with a continuation of the frontal costa as a longitudinal carina reaching nearly or quite to the anterior edge of the pronotum. The latter elevated, somewhat inflated and rounded between the humeri and anterior edge, but not especially rugose, on the disk between the median and humeral carinæ provided on each side with a short supplementary carina, posteriorly with several short irregular longitudinal rugæ, the apex broadly acuminate. Hind femora robust, the upper edge and outer face comparatively smooth.

General color dark fuscous, indistinctly mottled with paler. Hind tibiæ, and in fact the anterior and middle ones also, showing traces of annulation.

Length of body, ♂ and ♀, 6 mm.; of pronotum, 6 mm.; length to tip of pronotum, 7 mm.; of hind femora, 4 mm.

*Habitat*.—Four specimens, two from Para and two from Benevides, Brazil, collected in July by H. H. Smith. A nymph, apparently of this species, also from Benevides, is before me. Carnegie Museum, Pittsburgh.

Genus GLADIOTETTIX Hancock.

*Nephele* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 252.

*Gladiotettix* HANCOCK, Genera Insectorum, fasc. 48, 1906, footnote 40.

*Gladiotettix turgida* (Bolivar).

*Nephele turgida* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 252-253.

*Gladiotettix turgida* HANCOCK, Genera Insectorum, fasc. 48, 1906, 40.

*Habitat*.—Brazil, Upper Amazon, Peru.

The H. H. Smith collection contains specimens taken at Para and Benevides, Brazil. They were collected during the month of July. Carnegie Museum, Pittsburgh.

*Gladiotettix unicristata* Hancock.

*Nephele unicristata* HANCOCK, MS., Genera Insectorum, fasc. 48, 1906, 40.

*Gladiotettix unicristata* HANCOCK, *loc. cit.*, footnote.

The annexed description was prepared by Dr. J. L. Hancock and submitted to the present writer for insertion in a paper on British Guiana Orthoptera which has not been published as yet. The species should be credited to him in bibliographic references.

*Characters*.—A well marked species. ♂, body moderately robust, strongly rugoso-granulose, and provided with tubercles; color fusco-ferruginous, legs somewhat interspersed with lighter ferruginous, apical half of the tarsal articles fuscous. Face nearly vertical; vertex very wide, at the front margin barely more than twice the breadth of one of the eyes, crown very much shortened, the lateral margins little convergent forward, median carina obsolete with the exception of a barely elevated tubercle anteriorly; on either side the anterior half of the vertex fossulate, the front transversely carinate and truncate, viewed from in front barely concave, from above not advanced so far as the eyes, outwardly on either side next to the eyes the frontal carinæ little oblique, elevated tuberculiform; frontal costa viewed in profile lightly protuberant but flattened, viewed from in front the rami widely separated between the antennæ and parallel. Eyes prominent, globose, viewed from above somewhat reniform and sub-stylate; ocelli minute, placed between the inferior fourth of the eyes; antennæ situated distinctly below the ventro-anterior border of the eyes, the distance between them equal to about that from the eyes; last two articles of palpi strongly depresso-ampliate. Pronotum anteriorly trun-

cate, but the margin at the middle excavate, posteriorly subulate, distinctly passing the femoral apices, the apex of process little upturned, dorsum between the shoulders strongly compresso-elevated; the median carina strongly compressed forwards and formed into an elevated serrato-angulate crest, very thin and translucent when held against the light; the anterior margin of the crest situated before the shoulders, concave, and provided with tubercles, the posterior margin convex, serrato-crenulate, and extending backward to the anterior fifth of the hind femora; highest point of crest situated between the shoulders, the apex acute, and little produced forward; median carina posteriorly thin and inconspicuous, the dorsal surface strongly rugoso-subreticulate; humeral angles obtuse, interrupted anteriorly; supraelytral margin narrow, little convex; humero-apical carinæ very thin, enclosing a wide longitudinal scapular area above the supraelytral margin; anterior carinæ just behind the front border obsolete, and instead presenting minute tubercles; posterior angles of the lateral lobes little laminate outward, dentate produced, behind oblique and serrate; elytral sinus shallow. Elytra oval, punctate; wings fully explicate, barely longer than the pronotal process. Femora compressed, anterior femoral margins above undulate, inferior margins barely undulate; middle femoral margins sinuato-lobate; posterior femora stout, inflated, external pagina provided with many tumose elevations, the superior margin strongly arcuate, minutely serrulate and furnished with about four tubercles, the inferior margins straight, provided with two minute denticles, the ante-genicular denticle above large and elevated subobtusely; the genicular denticle strongly distinct and serrate but not produced backward; lateral margins of posterior tibiæ straight, scarcely at all expanded at the apices, regularly dentate, the denticles being very small, the canthi between the denticles minutely serrulate; first article of the posterior tarsi having the first and second pulvilli small and of equal length, the third much longer and subobsolete or flat below." (The third tarsal article as well as the antennæ of the "type" missing.)

Total length, ♂, 12.3 mm; of pronotum, 11.5 mm.; of posterior femora, 5.5 mm.

*Habitat*.—Demarara, British Guiana, collected by R. J. Crew. The type is in the collection of Professor L. Bruner.

***Gladiotettix hancocki* sp. nov.**

Rather closely related to the preceding species but differing from it in its somewhat larger size and in having the median carina even more

elevated and foliaceous, with its anterior edge reaching the front margin of the disk of the pronotum, straight and tridentate, the hind part of the crest less abrupt and serrato-crenulate. Surface of the pronotum rather closely punctate, less rugose than in the species with which it has just been compared. Frontal costa less prominent and the rami not so widely separated between the antennæ as described for *unicristata*. Lower posterior angles of the pronotum less prominent than in the preceding species, the anterior angle produced into a blunt tooth, back of this very gently crenulate. Tegmina elongate oval, the apex rounded. Wings complete, a trifle surpassing the apex of the pronotal process, which is smooth above instead of serrato-undulate as in the preceding species. Legs much the same as in the species with which it is being compared, possibly with the carinæ a trifle stronger and the teeth more pronounced. General color dark fuscous, with the apical half of the pronotum and hind femora tinged with ferruginous, the latter especially noticeably so.

Length of body, ♂, 8.5 mm.; of pronotum, 12.5 mm.; of hind femora, 5.35 mm.; length to tip of wings, 14.25 mm.; height of pronotal crest above humeri, 3 mm.

*Habitat*.—The type and only specimen of the present species comes from Para, Brazil, where it was taken during the month of July by H. H. Smith. The type is in the Carnegie Museum, Pittsburgh.

The three species of the present genus may be separated as follows:

- A. Median carina of the pronotum only gently compresso-elevated between the humeri; apical joint of the antennæ pallid; carinæ of anterior femora scarcely undulate. . . . . *turgida* Bolivar.
- AA. Median carina of the pronotum greatly compresso-elevated or foliaceous; carinæ of the anterior and middle femora undulate.
  - b. Crest of pronotum not reaching its anterior margin, not ascending abruptly in front but gradually, its height about equaling the width of dorsum between the base of the tegmina . . . . . *unicristata* Hancock.
  - bb. Crest of pronotum reaching its anterior margin and ascending abruptly in front, its height decidedly greater than the width of the dorsum between the base of the tegmina. . . . . *hancocki* sp. nov.

#### Genus CRIMISUS Bolivar.

*Crimisus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 246. — HANCOCK, Genera Insectorum, fasc. 48, 1906, 40.

The two species of this genus, neither of which is represented in the material at hand for study, may be separated by the annexed table.

- A. Pronotum posteriorly lengthily subulate. . . . . *patruus* Bolivar.
- AA. Pronotum posteriorly acuminate, not produced beyond the apex of the hind femora . . . . . *contractus* Bolivar.

**Crimisus patruus** Bolivar.

*Crimisus patruus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 246.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 40.

*Habitat*.—Upper Amazon.

**Crimisus contractus** Bolivar.

*Crimisus contractus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 246.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 40.

*Habitat*.—Peru.

## SCLEROTETTIX gen. nov.

As noted in the synopsis of subfamilies and genera on preceding pages this genus falls between *Crimisus* and *Metrodora* in the subfamily *Metrodorina*. It is characterized by having the body but little depressed, of moderate robustness, and more or less strongly carinate and rugose, in being winged and also having the posterior extremity of the pronotum acuminate and more or less elongated to or beyond the extremity of the hind femora. The vertex does not extend so far and is about as wide as the shortest diameter of one of the moderately prominent eyes, depressed at middle and provided at sides with quite prominent carinæ which when viewed from in front appear as small horns. The frontal costa is roundly prominent between the antennæ, but less so above, the sides only moderately divergent, the sulcation fairly deep. The lateral or posterior ocelli are situated near the middle of the eyes, while the antennæ are attached just below a line connecting their lower edges. Tegmina and wings present, the former of moderate size, the latter shorter than (*abbreviatus*) or plainly longer than the elongate or subulate pronotum (the remainder of the species). Anterior and middle femora with prominent carinæ which are either entire or else more or less lobed. Hind femora of medium length, fairly robust and rather strongly nodose-rugulose and granulose, their superior carina quite strong and produced into one or two rather prominent pregenicular and an apical tooth. Hind tibiæ but gently enlarged apically, most numerous and strongly spined on the external margin, where the number varies from 7 to 12, the inner edge with no spines on the apical third, the number on other portion varying from 3 to 5.

The species *tibialis*, herewith characterized, may be considered the type of the genus. All of the known species are South American, and come from the tropical regions.

## SYNOPSIS OF THE SPECIES OF SCLEROTETTIX.

- A. Body rather strongly carinated and rugose; the disk of the pronotum more or less strongly depressed; median carina compresso-elevated in front, undulate and interrupted posteriorly; lateral carinæ very prominent.



- b.* Pronotum and wings abbreviated, little if any longer than the abdomen, the wings decidedly shorter than the pronotum. . . . . *abbreviatus* sp. nov.
- bb.* Pronotum long and slender, the wings fully developed and extending beyond the apex of the pronotum.
- c.* Lower posterior angles of the pronotum strongly turned outwards, somewhat rounded. Middle femora with the lower carina straight, the apical portion of the thigh provided with a strong, long tooth; upper carina of hind tibiæ strongly lobate. All the tibiæ decidedly annulated with fuscous. . . . . *tibialis* sp. nov.
- cc.* Lower posterior angles of the pronotum less strongly turned outwardly, decidedly rounded. Median femora with the lower carina somewhat undulate, the tooth on the apical portion of the thigh less prominent, the upper carina of middle tibiæ not lobate. Tibiæ less conspicuously annulate. . . . . *variegatus* sp. nov.
- AA.* Body less strongly carinated and rugose; the disk of the pronotum a little rounded; median carina for the most part rather faint, only slightly compresso-elevated anteriorly and not at all or but gently undulate posteriorly; lateral carinæ less prominent.
- b.* Larger (♀, 13 mm. to tip of wings). Lower carina of middle femora straight. General color fuscous . . . . . *infuscatus* sp. nov.
- bb.* Smaller (♀, 9.5 mm. to tip of wings). Lower carina of middle femora undulate. General color ferruginous. . . . . *minor* sp. nov.

The members of the present genus also resemble somewhat closely those of the genus *Otumba*, but differ from them in the much more strongly carinated and rugulose pronotum and the clypeate median femora.

***Sclerotettix abbreviatus* sp. nov.**

The present species is characterized by having the surface of the pronotum coarsely rugulose at its sides and on the disk, and by being depressed above between the tegmina. The median carina of the pronotum is compresso-elevated anteriorly and undulate and interrupted back of the transverse sulcus. The apex of the pronotum only reaches to the tips of the hind femora at most, while the wings are still more abbreviated. The lower carina of the middle femora is very prominent and strongly lobed, while the hind femora are robust and rugoso-nodulose.

General color very dark brownish ferruginous, more or less varied above and on the legs with paler mottlings and maculations, below brownish testaceous, the tibiæ and tarsi plainly fasciate with fuscous. In some specimens the disk of the pronotum shows traces of the typical triangular velvety black markings so frequently seen on members of this family of locusts.

Length of body, ♂, 7 mm., ♀, 8 mm.; of pronotum, ♂, 7 mm., ♀, 8.5 mm.; of hind femora, ♂, 4.35 mm., ♀, 5.2 mm.

*Habitat*.—Chapada, near Cuyaba, Matto Grosso, Brazil, collected during April and May. Collection Carnegie Museum, Pittsburgh.

In the character of the lobe formation of the lower carina of the middle femora the present species and *minor* are quite similar, as are the lower posterior angles of the pronotum, but the comparative smoothness and the development of the pronotal process and wings are quite unlike.

***Sclerotettix tibialis* sp. nov.**

This insect may be recognized at once from the other species of the genus by the very prominent lateral pronotal carinæ and the depressed disk which gives to the dorsum of the pronotum the appearance of being inclosed by a wall. The median carina of the pronotum back of its anterior end is rather inconspicuous, while the pronotal process and wings are slenderly extended greatly beyond the apex of the hind femora.

Vertex about as wide as one of the eyes, depressed or sulcate anteriorly, provided with a narrow but plainly visible median carina, advanced but little if at all ahead of the front edge of the eyes, the antero-lateral carinæ gently curved, the outer end abruptly bent backwards and extended to the middle of the inner margins of the eyes,—these when viewed from in front appearing as minute horns; frontal costa inconspicuous above, and but gently advanced beyond the front edge of the vertex, quite prominently and roundly produced between the antennæ; evenly and moderately divergent, the sulcus profound. Lateral ocelli fairly prominent, located between the middle of the anterior edge of the eyes. Antennæ attached just without a line drawn from between the lower margin of the eyes, slender, of moderate length. Palpi in nowise conspicuous either by color or enlarged or depressed apical joints. Occiput provided with two rugosities, the head inserted into the anterior edge of the pronotum nearly to the eyes. Pronotum with the surface of sides and disk decidedly rugose and carinated, strongly depressed back of the shoulders. Lateral carinæ widely interrupted by the transverse sulci, which are profound, nearly parallel in front of these, continuous around the humeral angles to the apex of the tegmina or a little beyond, arched over the elytra and terminating beyond their apices; just within and a trifle in advance of the apices of these arise the very prominent bordering carinæ of the lengthily drawn out process. Disk of the pronotum between the shoulders gently convex and transversely rugose, back of this depressed and furnished along the middle with three or four elongate nodules or rugæ representing the otherwise almost obliterated median carina;

elytral sinus deeply and acutely emarginate, the scapular area very marked; lower posterior angles quite strongly turned outwards, their apices subrotund. Upper carina of the anterior femora fairly prominent, scarcely undulate; the lower carina more prominent and gently lobate or clypeate; the carinæ of the middle femora very prominent, clypeate, the lower one evenly increasing in width apically, provided with a strong tooth just in advance of the knee. Posterior femora robust, irregularly strongly rugose, the carinæ robust, the upper edge provided with three rather large wart-like elevations; hind tibiæ adorned externally with 11-12 and internally with 7 strong spines.

General color dark fuscous somewhat varied with testaceous and ferruginous on the disk and apex of the pronotum. Tibiæ pallid, strongly annulated with fuscous.

Length of body, ♂ and ♀, 8.5 mm.; of pronotum, 11.5-12 mm.; of hind femora, ♂ and ♀, 6 mm.

*Habitat*.—Chapada, Brazil, May, August, and November. Carnegie Museum, Pittsburgh.

#### ***Sclerotettix variegatus* sp. nov.**

Very similar to the preceding, but differing from it in the comparatively smoother pronotum and legs, and the less depressed dorsum of the pronotum, which in the present species has the lateral carinæ lower and the median one faint but continuous even between the nodose undulations. It also differs from *tibialis* in lacking the lobiform superior carina on the middle tibiæ, while the lower posterior angles of the pronotum in *variegatus* are less strongly turned outwards and more rounded than in the species with which compared.

Length of body, ♂ and ♀, 7.5 mm.; of pronotum, 9.5-10 mm.; of hind femora, 5 mm.

*Habitat*.—Chapada, Brazil, April, July, and October, collected by H. H. Smith. Carnegie Museum, Pittsburgh.

This insect while approaching *tibialis* in color and general appearance has the lower carina of the middle femora somewhat narrower and less foliaceous and at the same time showing a tendency towards being undulate.

#### ***Sclerotettix infuscatus* sp. nov.**

Body and pronotum much smoother and with carinæ lower than in the three preceding forms, about the size of *variegatus* but having the two sexes

very noticeably different in size. General color dark fuscous, conspicuously varied with testaceous on the pronotum and legs.

Summit of head finely granulose, depressed between the rather prominent eyes, a trifle narrower than the width of one of them, narrowing gently toward the vertex and provided with a low but distinct median carina; vertex gently depressed, not quite reaching the front edge of the eyes, the antero-lateral carinæ somewhat obliterated near the middle, their posterior ends bent back and extending along the inner margin of the eyes to about their middle. Frontal costa continuous with the median carina of the summit of the head but very slender and depressed above the point where it branches, fairly prominent between the antennæ and when viewed laterally roundly arcuate, profoundly but narrowly sulcate, the walls thin. Posterior ocelli small, situated a little below the middle of the front edge of the eyes; antennæ inserted just below the level of the lower edges of the eyes, slender, short, composed of about twelve joints. Pronotum granulose and more or less rugose at sides and on the disk anteriorly, produced in a slender point that extends considerably beyond the apex of the hind femora, the disk anteriorly gently convex, posteriorly somewhat flattened but not depressed, the median carina only briefly prominent just back of the anterior edge, back of this slender, low, very gently undulate but continuous; lateral carinæ on the front lobe inconspicuous, short, gently convergent posteriorly, widely interrupted in advance of the humeral angle, the scapular area inconspicuous; the disk between the humeri provided with several inconspicuous elongate rugæ or carinæ. Anterior and middle femora rather strongly carinated and more or less lobate, the lower edge of the latter especially so, the carina very wide and lobate beyond its middle, the subapical tooth present but not nearly so prominent as in the species *tibialis*; tibiæ weakly lobate on superior carina; posterior femora fairly robust and somewhat rugose, the upper edge not especially nodulose, the superior carina terminating in a weak tooth just in advance of the knee; hind tibiæ but little enlarged apically, weakly spined, the outer margin bearing 5 or 6 and the inner one either 4 or 5; the first and third tarsal joints about equal in length. Valves of the ovipositor moderately robust, both the upper and lower quite strongly serrated.

Length of body, ♂, 6.5 mm., ♀, 8 mm.; of pronotum, ♂, 8.25 mm., ♀, 10.5 mm.; of hind femora, ♂, 4.5 mm., ♀, 5 mm.

*Habitat.*—Corumba and Chapada, near Cuyaba, Matto Grosso, Brazil,

the former during April and the latter in June. Carnegie Museum, Pittsburgh.

**Sclerotettix minor** sp. nov.

The present species is quite similar in its general structure to the preceding, but differs from it in being much smaller in size, in the much paler color, the more prominent median carina of the pronotum, the more decidedly lobate lower carina of the middle femora, and the smoother hind femora.

The general color of this insect is testaceo-ferruginous, relieved by a pair of triangular velvety black patches on the disk between the scapular areas. The thighs and tibiæ are also more or less varied by fuscous markings.

Length of body, ♂, 4.5 mm., ♀, 6.25 mm.; of pronotum, ♂, 7 mm., ♀, 8 mm.; of hind femora, ♂ and ♀, 4 mm.

*Habitat*.—The single pair at hand is from Chapada, Brazil, where they were collected during April and May by H. H. Smith. They are deposited in the Carnegie Museum, Pittsburgh.

Genus **METRODORA** Bolivar.

*Metrodora* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 247-248, *part.*—HANCOCK, Genera Insectorum, fasc. 48, 1906, 41.

This genus has been greatly restricted by Hancock (see Genera Insectorum, fasc. 48, p. 41, footnote). Other species have been referred to the genera *Otumba*, *Chiriquia*, and *Scabrotettix*.

**Metrodora rana** Bolivar.

*Metrodora rana* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 248.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 41.

*Habitat*.—Upper Amazon. Not contained in the Smith collection or other South American material submitted for study by the Carnegie Museum.

**Metradora lutosa** Bolivar.

*Metrodora lutosa* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 248.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 41.

*Habitat*.—Brazil. Not at hand to be included in the present report.

These two species of the genus *Metrodora* may be separated as follows:

- A. The median carina of the vertex only gently produced; the posterior femora unarmed above ..... *rana* Bolivar.  
 A.A. The median carina of the vertex greatly produced; the posterior femora denticulate above ..... *lutosa* Bolivar.

## Genus OTUMBA Morse.

*Otumba* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 7.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 43.

The genus *Otumba* belongs to tropical America and is composed of a number of species, only a few of which have thus far been characterized. The following table will assist in their determination:

## SYNOPSIS OF THE SPECIES OF OTUMBA.

- A. Pronotum not provided with accessory abbreviated carinæ between the shoulders.
- b. Posterior angles of the lateral lobes of the pronotum rectangulate, not at all acute; humero-apical carinæ very strongly expressed, leaving a deep groove between them and the lateral carinæ.....*scapularis* Morse.
- bb. Posterior angles of the lateral lobes of the pronotum acute.
- c. Lateral lobes having the posterior angles little dentate, produced outwards, lightly angularly excavate behind; humero-apical carinæ of dorsum enclosing narrow grooves; vertex nearly quadrate; face below the eyes and lower part of lateral lobes of pronotum light yellow.  
*dentata* Hancock.
- cc. Lateral lobes with the posterior angles acute produced; median carina of the vertex strongly produced; superior carina of the hind femora irregularly undulate.....*spinifrons* Stål.
- AA. Pronotum bearing accessory abbreviated carinæ on each side between the shoulders.
- b. Dorsum with the abbreviated and humero-apical carinæ between the shoulders moderately distinct; tegmina fuscous, with or without a large yellow oblique macula on the posterior half; posterior angles of the lateral lobes rectangulate acute.
- c. Tegmina immaculate; the supplemental carinæ on the disk of the pronotum short, with a second pair likewise short, forming the apices of decussate lines thus:  $\times$  .....*peruviana* Bruner.
- cc. Tegmina flavo-maculate; the supplemental carinæ on the disk of the pronotum arcuate, of moderate length.....*lobata* Hancock.
- bb. Dorsum with the abbreviated humero-apical carinæ between the shoulders strongly expressed; posterior angles of the lateral lobes of the pronotum flattened, subobtuse angulate.
- c. Dorsum of the pronotum opposite the apex of the tegmina profoundly depressed; the disk beyond without the supplemental longitudinal carinæ; tegmina brownish testaceous.....*basalis* sp. nov.
- cc. Dorsum of the pronotum opposite the apex of the tegmina gently depressed; the disk beyond provided on each side with prominent longitudinal carinæ; tegmina grayish, streaked below with fuscous.  
*marcapata* Hancock.

**Otumba scapularis** Morse.

*Otumba scapularis* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 7-8, fig.—  
HANCOCK, Genera Insectorum, fasc. 48, 1906, 44.

*Habitat*.—Recorded from Nicaragua only, but undoubtedly occurring throughout Costa Rica and Panama as well.

**Otumba dentata** Hancock.

*Otumba dentata* HANCOCK, Genera Insectorum, fasc. 48, 1906, 44.

*Habitat*.—Costa Rica, Central America, and quite likely extending farther southward into northern South America.

**Otumba spinifrons** (Stål).

*Tetrix spinifrons* STÅL, Freg. Eugen. Resa., Ins. Orthopt., 1860, 346.

*Tettix spinifrons* STÅL, Recens. Orthopt., I, 1883, 151.

*Metrodora spinifrons* BOLIVAR, Ann. Soc. Ent. Belg., XXI, 1887, 249.

*Otumba spinifrons* HANCOCK, Genera Insectorum, fasc. 48, 1906, 44.

*Habitat*.—Brazil. A single individual contained in the H. H. Smith collection from Santarem is referred here. Carnegie Museum, Pittsburgh.

**Otumba peruviana** Bruner.

*Otumba peruviana* BRUNER, MS.

This species was represented among other Acridids collected in Peru by Professor Nicholas Iconnicoff of the University of Moscow, Russia, and submitted to the author of the present paper for determination. The full description will appear shortly in some European publication. In the meanwhile it may be recognized by the characterization given in the accompanying synoptic table of the species of the genus.

*Habitat*.—A point about 50 miles south and east of Cerro de Pasco, Peru, at an elevation of 1,800 meters above sea level. Zoological Museum of the University of Moscow.

**Otumba lobata** Hancock.

*Otumba lobata* HANCOCK, MS., Genera Insectorum, fasc. 48, 1906, 44.

The following is Dr. Hancock's description of this insect:

"*Characters*.—♂; Body moderately small, granulose, color fusco-ferugineous, sides of pronotum and legs lighter, slightly clouded with fuscous, hind femora above yellow, below fuscous, the hind tibiæ dark with light annulation near the knees; elytra fuscous, the posterior half marked by large oblique yellow macula. Head little compresso-elevated; face oblique; vertex little narrower than one of the eyes, distinctly longer than

wide, the lateral margins very slightly convergent forward, frontal carinæ on either side rounded, little elevated and abbreviated, median carina very low and thin, little more conspicuous anteriorly, the front border advanced almost as far as the eyes, viewed in front concave; between the eyes on either side of the median carina of the vertex little longitudinally canaliculate; occiput declivous; frontal costa barely protuberant between the antennæ, thinly compressed above between the eyes, and narrowly sulcate, the rami little thickened and barely widened forward to the median ocellus. Eyes globose, little elevated above the dorsum of the pronotum; ocelli moderately conspicuous, and placed between the ventro-anterior fourth of the eyes; palpi slender, little depressed apically. Pronotum anteriorly truncate, posteriorly straight subulate, passing the femoral apices, dorsum distinctly flattened; median carina percurrent, lightly compressed, thin, but distinct; humeral angles obtuse carinated, distinctly compressed before the shoulders; humero-apical carinæ distinct, inclosing a moderately wide scapular area on each side; dorsum behind the shoulders between the carinæ subfossulate; the anterior carinæ situated behind the anterior margin distinct and subparallel; the principal median sulcus of the lateral lobes conspicuous; elytral sinus very small; the inferior sinus large and angularly incised; posterior angles of the lateral lobes outwardly flattened rectangulate, the lateral margins before the acute apices barely convex, behind obliquely truncate, the middle of the lobes indistinctly transversely carinated to apices. Tegmina elongate, acuminate forward; wings perfectly explicate, as long as the pronotal process. Femoral carinæ entire, little compressed; posterior femora moderately robust, genicular denticles indistinct, the antegenicular denticles very small; posterior tibial margins nearly straight, barely ampliate near the apices, and sparingly acute dentate; the first and third articles of the posterior tarsi equal in length, the first and second pulvilli small and acute, the third pulvillus nearly as long as the first and second united; and flat below."

"Total length 10 mm.; pronotum 9 mm.; posterior femora 4.7 mm."

"*Habitat*.—Demarara, British Guiana, South America. The type is in Professor Bruner's collection."

**Otumba basalis** sp. nov.

Most nearly related to *O. marcajata* Hancock in its general size and form but differing from it chiefly in being more closely and sharply granulose on the pronotum and in the absence of the short longitudinal carinæ





cc. Larger (♂, 16.5 mm.); lateral lobes of pronotum not greatly produced outwards, wings extending beyond the pronotal process.

*acutilobus* Hancock.

AA. Vertex subequal in width to one of the eyes; dorsum lightly scabrous, granulate.

b. Tegmina black marked with a median whitish macula; posterior angles of the lateral lobes of pronotum to a slight extent angulate. . . . *amazonus* Bolivar.

bb. Tegmina plain ferruginous, immaculate; posterior angles of the lateral lobes of the pronotum flattened outwards, the apices a little rounded.

c. Wings not longer than the pronotal process. . . . . *bolivianus* Hancock.

cc. Wings longer than the pronotal process. . . . . *bolivianus extensus* Hancock.

### Scabrotettix scabrosus Hancock.

*Scabrotettix scabrosus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 47.

*Habitat.*—Bolivia.

### Scabrotettix magistralis Brunner.

*Metrodora magistralis* BRUNNER V. WATTENWYL, Berl. Ent. Zeit., XIV, 1900, 254-255, pl. 3, fig. 1.

*Scabrotettix magistralis* HANCOCK, Genera Insectorum, fasc. 48, 1906, 47.

*Habitat.*—Colombia, South America.

### Scabrotettix acutilobus Hancock.

*Scabrotettix acutilobus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 47, pl. 4, figs. 37, 37a.

*Habitat.*—Mapiri, Bolivia.

### Scabrotettix amazonus Bolivar.

*Metrodora amazona* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 249.

*Scabrotettix amazonus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 47.

*Habitat.*—Upper Amazon; Ecuador.

### Scabrotettix bolivianus Hancock.

*Scabrotettix bolivianus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 47.

*Habitat.*—Bolivia.

### Scabrotettix bolivianus extensus Hancock.

*Scabrotettix bolivianus extensus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 47.

*Habitat.*—Mapiri, Bolivia.

### Genus ALLOTETTIX Hancock.

*Allotettix* HANCOCK, Ent. News, X, 1899, 276.—MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 12.—HANCOCK, Tettig. N. Am., 1902, 126-127; Genera Insectorum, fasc. 48, 1906, 48.

The genus *Allotettix*, which is practically confined to South America and the extreme southern parts of North America, is composed of several

species of very long-winged slender insects. Five species have been recognized heretofore and two are now added. They may be separated by the subjoined table.

SYNOPSIS OF THE SPECIES OF ALLOTETTIX.

- A. Sides of frontal costa rather strongly divergent below. Posterior angles of lateral lobes of the pronotum angulate and directed gently outward. Tegmina unicolorous, fuscous. Maxillary palpi with outer joints strongly dilated. . . . . *fuscipennis* sp. nov.
- AA. Sides of frontal costa only gently divergent. Posterior angles of the lateral lobes of the pronotum turned down. Terminal joints of the maxillary palpi only gently dilated.
- b. Vertex decidedly narrower than one of the eyes. Pronotum lacking considerable of reaching the tips of the wings. . . . . *americanus* Hancock.
- bb. Vertex little, if at all, narrower than one of the eyes. Pronotum extending caudad nearly or quite as far as the greatly lengthened wings.
- c. Smaller (11-14.5 mm.).
- d. Middle femora with the carinæ not at all foliaceous or undulate, always fully three times or more as long as wide.
- e. Pronotum on disk back of the humeri concave. . . . . *peruvianus* Bolivar.
- ee. Pronotum on disk back of the humeri not concave. . . . . *chipmani* Bruner.
- dd. Middle femora with the carinæ somewhat foliaceous or undulate, sometimes little more than twice as long as wide.
- e. Middle femora undulate but not at all foliaceous, about three times as long as wide. . . . . *cayennensis* Bolivar.
- ee. Middle femora with the carinæ somewhat foliaceous, but a trifle more than once again as long as broad. . . . . *chapadensis* sp. nov.
- cc. Larger (16-17.5) . . . . . *prolongatus* Hancock.

**Allotettix fuscipennis** sp. nov.

A moderately large and comparatively robust species in which the vertex is nearly or quite as wide as one of the prominent eyes, and the posterior lateral edges of the pronotum are angulate and turned outward. General color brownish testaceous, the tegmina fuscous.

Head of moderate size; eyes large, prominent, subglobose, separated above by a space nearly or quite equal to the width of one of them; top of head granulose, depressed, provided at the middle with a fairly prominent longitudinal carina beginning at a point a little in advance of a line drawn between the back edge of the eyes and extending forward, uniting roundly with the upper end of the frontal costa; the latter not very prominent, viewed laterally roundly produced between the antennæ, profoundly sulcate and with the walls quite widely divergent below; vertex depressed, not advanced as far as the eyes, the lateral carinæ rather

prominent, arcuate, their outer end reaching backward to near the upper edge of the middle of the eyes. Antennæ arising decidedly below the eyes; the posterior ocelli between the lower edge of the eyes. Pronotum lengthily subulate and reaching the tips of the wings; anterior margin truncate, embracing the head nearly to the eyes; the surface granulose, somewhat uneven, the median carina plain throughout, slightly elevated between the humeri and again between the sulci; lateral carinæ prominent and arcuate in advance of the first sulcus, interrupted between the sulci, prominent at the rounded humeri and beyond. Legs moderately long and slender, the middle femora more than three times their greatest diameter, hind pair with the outer disc rugose; hind tibiæ almost destitute of spines, the first and third tarsal joints about equal in length. Antennæ approximately 13-jointed, coarsely filiform about reaching the middle of the tegmina. Latter of moderate size, oblong ovate.

General color uniformly dirty, pale brown or brownish testaceous, with piceous traces on sides of pronotum anteriorly. Tegmina uniformly fuscous. Hind femora faintly clouded with fuscous, while the anterior and middle tibiæ show faint traces of dusky annulation. Tips of antennæ only infuscated.

Length of body, ♂, 7.5-8 mm.; of pronotum, 11.5 mm.; to tip of wings, 12 mm.; of hind femora, 5.2 mm.

*Habitat*.—Three males, one from Para, in June, another from Chapada, near Cuyaba, Matto Grosso, the same month, and the third from Benevides, Brazil, taken in July. These presumably were all taken by H. H. Smith. Collection Carnegie Museum, Pittsburgh.

This insect does not quite agree with the present genus in some of its characters, nor does it seem to belong in *Scabrotettix*, to which it appears to be related also. The wide furcation of the frontal costa is unique for both genera, while the angulate, outwardly turned hind margins of the pronotum are not found in other species of *Allotettix*.

#### **Allotettix americanus** Hancock.

*Allotettix americanus* HANCOCK, Trans. Ent. Soc. Lond., 1907, 234.

*Habitat*.—Cachabi, Ecuador.

#### **Allotettix peruvianus** Bolivar.

*Paratettix peruvianus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 272.

*Allotettix peruvianus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 48, fig. 18.

*Habitat*.—This species is found from Costa Rica in North America through Panama into Colombia, Peru, Bolivia, and the extreme north-

western parts of Argentina. No specimens seem to be at hand among the H. H. Smith collection now being studied.

**Allotettix chipmani** Bruner.

*Allotettix chipmani* BRUNER, Journ. N. Y. Ent. Soc., XIV, 1906, 146.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 48.

*Habitat*.—Trinidad Island, West Indies and British Guiana, South America.

**Allotettix cayennensis** Bolivar.

*Paratettix cayennensis* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 273.

*Allotettix cayennensis* HANCOCK, Genera Insectorum, fasc. 48, 1906, 48.

*Habitat*.—Originally described from Cayenne, French Guiana. There are several specimens at hand which were taken at Santarem, Brazil. They were collected in the month of August. Carnegie Museum, Pittsburgh.

**Allotettix chapadensis** sp. nov.

This insect seems to be most closely related to *A. cayennensis* of Bolivar, from which it differs most notably in the form of the middle femora, which are somewhat clypeate or foliaceous in the present species.

Head small, the summit depressed, tricarinate, coarsely granulate; fastigium not advanced in front of the eyes, the lateral carinæ only moderately prominent, abruptly bent to the rear and following the inner edge of the eyes to their middle; frontal costa quite abruptly prominent between the antennæ, its sides rather widely divergent and profoundly sulcate; posterior ocelli situated just below the middle and the antennæ below the lower edge of the eyes. Pronotum lengthily caudate, the surface closely granulose and provided on the disk between the somewhat angulate humeri with a few irregular rugosities, the surface back of this and between the apical half of the tegmina gently depressed; median carina slender but prominent, anteriorly elevated between the transverse sulci, very low just in advance of the humeri, viewed laterally gently undulate; posterior lateral edges widely rounded and little turned out. Tegmina of moderate size, elongate oval, the surface rather evenly and coarsely punctate. Anterior femora normal, middle femora with the upper and lower carinæ somewhat clypeate, more or less undulate, not much more than twice as long as their extreme width; hind femora normal, the tibiæ irregularly spined, the first joint of the tarsi a little longer than the third.

General color dull fuscous, becoming a little paler at sides of pronotum,

in face and below. Lower edge of hind femora dark brown or dull black, the tibiæ plainly fasciate.

Length of body, ♂, 5.5 mm.; of pronotum, 10 mm.; to tip of wings, 11.25 mm.; of hind femora, 4 mm.

*Habitat*.—Chapada, near Cuyaba, Matto Grosso, Brazil, two male specimens, collected by H. H. Smith. Type in the Carnegie Museum, Pittsburgh.

**Allotettix prolongatus** Hancock.

*Allotettix prolongatus* HANCOCK, Ent. News, X, 1899, 276-277; Genera Insectorum, fasc. 48, 1906, 48.

*Habitat*.—Bolivia, S. America.

Genus MITRITETTIX Hancock.

*Mitraria* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 253.

*Mitritettix* HANCOCK, Genera Insectorum, fasc. 48, 1906, 57, footnote.

**Mitritettix productus** Bolivar.

*Mitraria producta* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 253.

*Mitritettix productus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 51.

*Habitat*.—Upper Amazon. Not contained in the present collection.

Subfamily TETRIGINÆ.

Genus TEREDORUS Hancock.

*Teredorus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 52-53.

**Teredorus stenofrons** Hancock.

*Teredorus stenofrons* HANCOCK, Genera Insectorum, fasc. 48, 1906, 53, pl. 4, fig. 42.

*Habitat*.—Pachitea, Peru. Not in the collection made by H. H. Smith and now being reported upon.

Genus CLYPEOTETTIX Hancock.

*Clypeotettix* HANCOCK, Tettig. N. Am., 1902, 124; Genera Insectorum, fasc. 48, 1906, 54.

**Clypeotettix schochi** (Bolivar).

*Paratettix schochii* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 274.

*Clypeotettix schochi* HANCOCK, Tettig. N. Am., 1902, 124-125, pl. 7, fig. 1; pl. 9, figs. 10, 11; Genera Insectorum, fasc. 48, 1906, 54, pl. 3, fig. 24.

*Habitat*.—Mexico, Central America and Venezuela in South America.

Genus PARATETTIX Bolivar.

*Paratettix* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 240.—MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 11.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 55.

The genus *Paratettix* like *Tetrix* is a rather large one and the species are widely distributed over the earth's surface. Only a very few of them, however, are found in South America. These may be separated as follows:

- A. Body rather robust; pronotum not extending beyond the apex of hind femora.  
*borelli* Giglio-Tos.
- A.A. Body somewhat slender; the apex of the pronotum extended decidedly beyond the tips of the hind femora.
- b. Larger (♂, 7.5 mm., ♀, 11 mm.); the apex of pronotum not greatly extended beyond the apex of the hind femora and tip of abdomen. *simoni* Bolivar.
- bb. Smaller (♂, 6 mm., ♀, 8 mm.); the apex greatly surpassing the tip of the abdomen and apex of hind femora. . . . . *gracilis* Bruner.

#### *Paratettix borelli* Giglio-Tos.

*Paratettix borelli* GIGLIO-TOS, Boll. Mus. Zool. Anat. Comp. Torin., XII. no. 302, 1897, 28-29.—BRUNER, Locusts of Argentina, 1900, 16.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 56.

*Habitat*.—This species is common throughout Argentina, especially northward of Buenos Aires, and occurs also in Bolivia, Paraguay, and adjoining portions of Brazil. Individuals are at hand from Corumba and nearby localities. Some of these latter bear the label "highlands." Carnegie Museum, Pittsburgh.

#### *Paratettix simoni* Bolivar.

*Paratettix simoni* BOLIVAR, Ann. Soc. Ent. Fr., (6), X, 1900, 138-139.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 56.

*Habitat*.—Venezuela, Co'ony Tovar.

#### *Paratettix gracilis* (Bruner).

*Nephele gracilis* BRUNER, Locusts of Argentina, 1900, 15.

*Paratettix gracilis* HANCOCK, Genera Insectorum, fasc. 48, 1906, 57.

*Habitat*.—Paraguay, Argentina, Southwestern Brazil.

This insect approaches some of the species of the genus *Allotettix* in its general appearance, but has the posterior lateral angles of the pronotum turned down, as shown by an examination of typical specimens in the writer's collection.

#### Genus TETRIX Latreille.

*Tetrix* LATREILLE, Hist. Nat. Crust. Ins., III, 1802, 284, *part.*

*Acrydium* GEOFFROY, Hist. Ins., I, 1762, 390.—FABRICIUS, Syst. Ent., 1775, 278.—LEACH, Edinb. Encycl., IX, 1815, 120.

*Tetrix* FISCHER, Orthopt., Russ., 1846, 346, and others.

The species of this genus are both numerous and widely scattered over the world, but are confined for the most part to the regions north of the

equator. As now restricted only a single species of the genus, and it not quite typical, is found in South American territory.

***Tetrix gracilis* (Bruner).**

*Tetrix gracilis* BRUNER, Journ. N. Y. Ent. Soc., XIV, 1906, 145.

*Habitat.*—Island of Trinidad, West Indies. It very likely inhabits the mainland of South America in British Guiana as well.

This species seems to have been overlooked by Dr. J. L. Hancock in his write-up of the family for Genera Insectorum. He previously examined the type specimen and agreed that it was a member of the genus *Tetrix*, though not quite typical.

Genus **STENODORUS** Hancock.

*Stenodorus* HANCOCK, Ent. News, XVII, 1906, 90; Genera Insectorum, fasc. 48, 1906, 59-60.

Only a single species of the genus is known.

***Stenodorus extenuatus* Hancock.**

*Stenodorus extenuatus* HANCOCK, Ent. News, XVII, 1906, 91; Genera Insectorum, fasc. 48, 1906, 60, pl. 4, fig. 39.

*Habitat.*—Peru, South America.

Genus **MICRONOTUS** Hancock.

*Micronotus* HANCOCK, Tettig. N. Am., 1902, 97; Genera Insectorum, fasc. 48, 1906, 63.

This is a South American genus composed of several species. It is rather closely related to *Tetrix*, from which it differs as indicated in the synoptic table of subfamilies and genera on preceding pages of this paper. The subjoined table will assist in the recognition of the species:

SYNOPSIS OF THE SPECIES OF MICRONOTUS.

- A. Pronotum somewhat abbreviated posteriorly, the apex not passing the tips of the hind femora.
  - b. Median carina of the pronotum very prominent and quadriundulate, surface rugoso-granulate ..... *quadriundulata* Redtenbacher.
  - bb. Median carina of the pronotum less prominent and inconspicuously triundulate, the surface simply granulate..... *hancocki* sp. nov.
- AA. Pronotum elongated, its apex extending beyond the tips of the hind femora.
  - b. Form moderately robust, the carinae of the anterior femora strongly compresso-undulate; apex of the hind edge of the pronotum not greatly lengthened beyond the tips of hind femora; the third joint of the hind tarsi longer than the first and second combined..... *asperulus* Bolivar.



*bb.* Form more slender, the carina of the middle femora dentato-lobate; apex of the hind edge of the pronotum greatly lengthened beyond the tips of the hind femora; the first joint of the hind tarsi slightly longer than the others ..... *caudatus* Saussure.

**Micronotus quadriundulatus** (Redtenbacher).

*Tettix quadriundulatus* REDTENBACHER, Proc. Zool. Soc. Lond., 1892, 208-209, pl. 16, fig. 10.

*Micronotus quadriundulatus* HANCOCK, Tettig. N. Am., 1902, 98; Genera Insectorum, fasc. 48, 1906, 63.

*Habitat.*—Islands of Grenada, Haiti, Trinidad, and St. Vincent, West Indies.

**Micronotus hancocki** sp. nov.

About the same size and of the same general form as the preceding, from which it differs chiefly in having the body smoother, and in having less prominent and only three instead of four undulations in the median pronotal carina.

*Habitat.*—This species, or form, comes from the island of Trinidad.

**Micronotus asperulus** Bolivar.

*Tettix asperulus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 260.

*Micronotus asperulus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 63.

*Habitat.*—Apiahy, Brazil. Not recognized among the material studied.

**Micronotus caudatus** (Saussure).

*Tettix caudatus* SAUSSURE, Rev. et Mag. Zool., 1861, 31.

*Paratettix caudatus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 274-275.

*Micronotus caudatus* HANCOCK, Genera Insectorum, fasc. 48, 1906, 63.

*Habitat.*—This species appears to be rather widely distributed over tropical South America, since it has been reported from the island of Trinidad, the Guianas, various localities in Brazil, Paraguay, and Argentina.

Unless specimens in the Carnegie Museum that have been referred to *Allotettix* and described as *chapadensis* are really the present form the Smith collection does not contain any examples of *M. caudatus*.

Genus APOTETTIX Hancock.

*Apotettix* HANCOCK, Tettig. N. Am., 1902, 99-100; Genera Insectorum, fasc. 48, 1906, 64.

Representatives of the present genus occur in both North and South America. The two belonging to the latter country are separated as follows:

A. Vertex nearly twice the breadth of one of the eyes; dorsum of pronotum rugososcabrous, the posterior lateral angles subproduced, obliquely truncated.

*bruneri* Hancock.

AA. Vertex little wider than one of the eyes; dorsum of pronotum little rugosogranulate, lateral lobes little reflexed outward, the posterior angles distinctly rounded or obtuse . . . . . *proximus* Hancock

#### **Apotettix bruneri** Hancock.

*Apotettix bruneri* HANCOCK, in BRUNER, List Paraguayan Locusts, 1906, 614; Genera Insectorum, fasc. 48, 1906, 65.

*Habitat*.—Paraguay, South America.

#### **Apotettix proximus** Hancock.

*Apotettix proximus* HANCOCK, Trans. Ent. Soc. Lond., 11, 1907, 237-238.

*Habitat*.—Cachabi and Paramba, Ecuador. Not contained in the material before me.

#### Genus **PROTOTETTIX** Bolivar.

*Prototettix* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 255.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 65.

Representatives of this genus occur both in the Neotropical and Ethiopian regions. Two forms are known from South America. They are separated thus:

A. Tegmina minute, almost hidden beneath the pronotum, the median carina of the latter sinuate; anterior femora subfusiform, the middle one compressed and with their carinae undulately lobate. . . . . *fossulatus* Bolivar.

AA. Tegmina small but conspicuous, the median carina of the latter bisinuate; anterior femora compressed, their carinae undulato-lobate. . . *lobulatus* Stål.

#### **Prototettix fossulatus** Bolivar.

*Prototettix fossulatus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 256.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 65.

*Tettix miserabilis* BLANCHARD, in GAY, Hist. fis. Chile, 1852, 85, pl. 3, fig. 10.

*Habitat*.—Apirahy, Brazil, and Chile. The present collection contains two specimens which are referred here, one of them ( $\sigma$ ) from "Rio" (in all probability Rio de Janeiro) in November, the other ( $\varphi$ ) from Chapada, taken in December. Carnegie Museum, Pittsburgh.

#### **Prototettix lobulatus** (Stål).

*Tettix lobulatus* STÅL, Freg. Ugen. Resa, Ins. Orth., 1860, 347.

*Tettix lobulatus* STÅL, Recens. Orthopt., I, 1873, 152.

*Prototettix lobulatus* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 256.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 65.

*Habitat.*—This insect has been recorded from both Argentina and Brazil. It is not represented in the present collections.

Subfamily *BATRACHIIDINÆ*.

Genus *TETTIGIDEA* Scudder.

*Tettigidea* SCUDDER, Bost. Journ. Nat. Hist., VIII, 1862, 476.—BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 299.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 67.

The genus *Tettigidea* is confined entirely to the Occident, where the species are distributed over the Neotropical, Sonoran, lower part of the Upper Sonoran, Austroriparian, Carolinian, and Transition regions. About two score of species are already recognized if the ten that are described as new in the present paper are included. These species are readily separated into two distinct groups by the construction of the anterior edge of the pronotum. They are also separable into an equal number of groups either by having the dorsum of the pronotum simply granulose or rugose, or by having its disk supplied with supplemental longitudinal carinæ. Since about one-half of the species belong to South America the annexed synoptical table has been prepared to show the relationship of all of them.

SYNOPSIS OF THE SPECIES OF *TETTIGIDEA*.

- A. Middle of the anterior margin of the pronotum at most angulate, but in nowise provided with a spine.
- b. Dorsum of pronotum furnished with prominent, or at least well-defined longitudinal supplemental carinæ.
- c. Tegmina more or less conspicuously marked apically with a pallid dash, band, or macula.
- d. Frontal costa very prominent and strongly visible from above.
- e. Vertex of the head but little advanced in front of the eyes.
- f. Larger (length of ♀ body 12 or more mm.). Anterior margin of the pronotum broadly rounded.
- g. Form somewhat slender, the wings and pronotal process extending plainly beyond the tips of the hind femora.
- h. Rugulæ of the pronotum fairly prominent and quite regular (U. S., southeasterly) . . . . . *lateralis* Say.
- hh. Rugulæ of the pronotum faint, short, and irregular (southern Mexico) . . . . . *plagiata* Morse.
- gg. Form more robust, the pronotum and wings abbreviated (U. S., east of the great plains) . . . . . *polymorpha* Scudder.
- ff. Smaller (length of the ♀ body 9.5–10 mm.). Wings fully developed (southern Mexico) . . . . . *parvula* Morse.
- ee. Vertex of the head rather strongly advanced in front of the eyes. Front margin of the pronotum obtusangulate (U. S. and Canada, east of the plains) . . . *parvipennis* Harris, *parvipennis pennata* Morse, and *medialis* Hancock.

- dd.* Frontal costa less prominent and not at all conspicuous when viewed from above.
- e.* Disk of the pronotum furnished with two or more well-defined supplemental carinae on each side of the middle.
- f.* Apex of the pronotum and wings scarcely reaching to the tips of the hind femora (North Carolina and Georgia) . . . . . *prorsa* Scudder.
- ff.* Apex of the pronotum extending beyond the tips of the hind femora (Georgia) . . . . . *prorsa elongata* Morse.
- cc.* Disk of the pronotum provided with but a single inconspicuous carina on each side parallel with the humeral angles.
- f.* Pronotal process little, if any, longer than the abdomen, scarcely reaching the hind femora; the wings somewhat abbreviated (Mexican Plateau, southward) . . . . . *chichimeca* Saussure.
- ff.* Pronotal process subulate, surpassing the apex of the hind femora; wings fully developed and exceeding the pronotum in length (Cuernavaca, Morelos, Mexico) . . . *chichimeca australis* Hancock.
- cc.* Tegmina unicolorous, immaculate apically.
- d.* Size medium, the body robust, with abbreviated pronotal process and wings.
- e.* Disk of the pronotum granular and provided on each side with at least two well-marked supplemental carinae. Top of the head depressed and without a pair of supplemental carinae that parallel the median (Ciudad, Mexico) . . . . . *tecta* Morse.
- ee.* Disk of the pronotum rugoso-glabrous and provided on each side with but a single inconspicuous supplemental carina. Top of the head a little convex and provided on each side of the middle with a strong longitudinal carina that is both heavier and longer than the median (Chapada, Brazil) . . . . . *annulipes* sp. nov.
- dd.* Size small (♀, 8 mm.). Pronotum and wings surpassing the hind femora (Upper Amazon) . . . . . *scudderi* Bolivar.
- bb.* Dorsum of the pronotum simply granulose or rugose, not provided with well-defined supplemental, longitudinal carinae.
- c.* Size of insects variable, but usually rather large. Tegmina marked at or near the apex with an oblique line or band.
- d.* Median carina of the pronotum alternately pallid and fuscous. The dorsum somewhat rugose.
- e.* Pronotum and wings abbreviated. General color brownish testaceous. Median carina of pronotum somewhat undulate (southern Mexico).  
*bruneri* Morse.
- ee.* Pronotum and wings variable. Color also variable.
- f.* Size moderately small (♀, 10 mm.). Color pale gray. Pronotum extending a little beyond the apex of the hind femora (Guatemala) . . . . . *guatemalica* Bolivar.
- ff.* Size larger (♀, 12-14 mm.). Color chiefly fuscous.
- g.* Legs ferrugino-testaceous quite conspicuously annulated with fuscous.

- h. Pronotum and wings lengthily subulate, extending well beyond the tips of the hind femora (Nicaragua). . . . . *nicaraguas* Bruner.
- hh. Pronotum and wings abbreviated, not quite reaching to the apex of the hind femora (Costa Rica).  
*nicaraguas brevis* Hancock.
- gg. Legs pale throughout, not annulate with fuscous (Jalapa, Mexico).  
*jalapa* Hancock.
- dd. Median carina of the pronotum unicolorous, fuscous; the dorsum finely granulose. Tegmina and wings more or less strongly abbreviated.
- e. Form robust; face, venter and apical two or three segments of the male abdomen pallid (Guerrero, Mexico). . . . . *nigra* Morse.
- ee. Form moderately slender; face and abdomen of female at least concolorous, fuscous (Island of Trinidad, West Indies).  
*imperfecta* Bruner.
- AA. Middle of anterior margin of the pronotum both angulate and provided with a prominent anteriorly projecting spine.
- b. Dorsum of the pronotum granulose or scabrous, scarcely rugose, without any well-defined supplemental longitudinal carinae.<sup>1</sup>
- c. Pronotum and wings more or less strongly abbreviated, scarcely reaching the apex of the abdomen.
- d. Body and disk of the pronotum finely granulose, scarcely rugose.
- e. Antennæ of normal length.
- f. Size large (length of ♀ body 17.5 mm.) (Eastern slopes of Peruvian Andes) . . . . . *cuspidata* Scudder.
- ff. Size smaller (length of ♀ body 12.8 mm.) (Paramba, Ecuador).  
*planus* Hancock.
- ee. Antennæ excessively long and slender, fully as long as or longer than the hind femora (Para and Chapada, Brazil) . . . . . *gracilicornis* sp. nov.
- dd. Body and disk of the pronotum rather strongly granulose or even rugulose, the rugæ gathering into more or less well-defined longitudinal ridges, but in nowise giving the impression of supplemental longitudinal carinae (Georgia and Florida). . . . . *spicata* Morse.
- cc. Pronotum and wings fully developed and extending beyond the apex of the ovipositor or even well beyond the apex of the hind femora.
- d. Surface of the pronotum scabrous, the apex of the pronotal process not quite reaching the tips of the hind femora (British Guiana).  
*pulchella* Rehn.
- dd. Surface of the pronotum at most coarsely granulose, some of the granules on the disk gathered into short irregular longitudinal rows.
- e. Anterior lateral carinae of pronotum parallel (Chapada, Brazil).  
*chapadensis* sp. nov.
- ee. Anterior lateral carinae of the pronotum distinctly convergent posteriorly (Island of Trinidad, West Indies). . . . . *trinitatis* Bruner.

<sup>1</sup>The *Tetrix purpurascens* Serville may possibly be a *Tettigidea* and belong to this section. (See Hancock, Genera Insectorum, fasc. 48, 1906, 69.)

- bb. Dorsum of the pronotum more or less strongly granulose or rugose and provided on either side of the disk with one or more well-defined supplementary carinae.
- c. Tegmina maculate (North American).
- d. Disk of the pronotum smoothly granulated, the sides provided with weak but well-defined supplemental carinae. Vertex but little advanced in front of the eyes (New York).....*acuta* Morse.
- dd. Disk of the pronotum coarsely and distinctly rugulose.
- e. Vertex considerably advanced in front of the eyes as in *T. prorsa* Scudder, rather wide. Pronotum granulose between the shoulders (Florida and Louisiana).....*apiculata* Morse.
- cc. Vertex but little advanced in front of the eyes. The pronotum strongly rugose throughout.
- f. Pronotum and wings complete, surpassing the tips of the hind femora (southeastern U. S. east of the Mississippi)....*armata* Morse.
- ff. Pronotum and wings abbreviated, the former not quite reaching the tips of the hind femora (same locality as preceding).  
*armata depressa* Morse.
- cc. Tegmina immaculate [South America].
- d. Pronotal process always lengthily subulate, the wings fully developed.
- e. Disk of the pronotum quite strongly longitudinally rugose as well as provided with supplemental longitudinal carinae. Upper end of the frontal carina prominent, the median sulcus of the top of the head profound (Corumba, Brazil).....*hancocki* sp. nov.
- ee. Disk of the pronotum coarsely granulose, the supplemental carinae variable. Upper end of the frontal carina inconspicuous, the median sulcus of the top of the head only moderately excavated.
- f. Supplemental longitudinal dorsal carinae not very marked, the general form of the insects quite similar in appearance to *T. lateralis*.
- g. Median carina of pronotum not at all arched in advance of the humeri; the frontal costa sulcate but little above the lateral ocelli (Chapada, Brazil).....*australis* sp. nov.
- gg. Median carina of the pronotum arched in advance of the humeri. the frontal costa sulcate almost to its summit (Chapada).  
*intermedia* sp. nov.
- ff. Supplemental carinae of the pronotum very marked. General form of insect rather slender (Chapada, Brazil).....*costalis* sp. nov.
- dd. Pronotal process nearly always much abbreviated, not extending beyond the apex of the hind femora; wings seldom complete.
- e. Dorsum of the pronotum only gently rounded, never tectate, the median carina straight (Chapada, Brazil).....*subaptera* sp. nov.
- ee. Dorsum of pronotum more or less strongly tectate, the median carina prominent and arcuate.
- f. Median carina of the pronotum very prominent and strongly arcuate, the dorsum strongly tectate. Wings sometimes complete (Chapada, Brazil).....*arcuata* sp. nov.
- ff. Median carina of the pronotum less prominent and arcuate. Wings always abbreviated.

- g. Smaller (♀, 11–12 mm. in length); the supplemental, longitudinal carinæ visible but inconspicuous (Bolivia, Paraguay, Argentina, and southwestern Brazil) . . . . . *multicostata* Bolivar.  
 gg. Larger (♀, 15–16 mm. in length); the supplemental carinæ very conspicuous (Chapada, Brazil) . . . . . *corrugata* sp. nov.

***Tettigidea annulipes* sp. nov.**

Very similar in size and general form to *T. subaptera*, which is described on a succeeding page, but differing from it in being a little more robust, in having the anterior edge of the pronotum spineless and in having the entire surface glabrous or more or less varnished in appearance, although the disk of the pronotum is quite strongly rugose instead of granulose as in *subaptera*. Wings abbreviated or wanting. Vertex reminding one of that of the North American *T. prorsa* Scudder.

Head high and narrow, the front somewhat oblique; top of head between the eyes with prominent longitudinal rugæ and deep sulcus; the vertex strongly projecting in front of the eyes, the lateral oblique carinæ partially obliterated or low next to the eyes; frontal costa prominent, coarse, not very deeply but narrowly sulcate, viewed in profile broadly rounded. Pronotum short, subangulate in front, without the spine so commonly found in the South American species of the genus, subtectate anteriorly, the median carina coarse and prominent, viewed laterally arcuate between the shoulders and front edge; rather strongly rugose at sides and on the disk and on the latter between the shoulders tending to form a longitudinal carina on each side midway between the median and lateral carinæ; apex blunt, reaching to the base of the supra-anal plate, which is long and acuminate, the basal half formed of two leaf-like lobes, cerci long, rather heavy, and adorned with a number of long stiff hairs; valves of the ovipositor long and slender, strongly serrated. Hind femora robust, smooth, reaching the tips of the ovipositor. Two outer joints of the maxillary palpi broadly dilated and sulcate externally.

General color above and on the sides of abdomen piceous, all the legs (including hind femora) prominently fasciate with dull testaceous; lower side pallid, apical joints of palpi dirty white. Tegmina fuscous, unicolorous.

Length of body, ♀, 12 mm.; of pronotum, 8.75; of hind femora, 7 mm.

*Habitat*.—A single female specimen, the type, is before me. It was collected by H. H. Smith during the month of May at Chapada, near Cuyaba Matto Grosso, Brazil. Carnegie Museum, Pittsburgh.

There is also a single male among the large number of specimens of

*Tettigidea* taken at or near Chapada which I was at first inclined to place here. It differs from the female, however, in the less advanced vertex, the less prominent frontal costa and in having the pronotum both spined in front and strongly attenuate behind.

***Tettigidea scudderi* Bolivar.**

*Tettigidea scudderi* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 299.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 68.

*Habitat.*—Upper Amazon. Not contained in the collection made by H. H. Smith.

***Tettigidea nicaraguæ brevis* Hancock.**

*Tettigidea nicaraguæ brevis* HANCOCK, Tettig. N. Am., 1906, 158.

*Habitat.*—This form of *T. nicaraguæ* occurs on the Atlantic side of Costa Rica, where it is fairly common in suitable localities. It may continue southward into the adjoining parts of South America.

Other species of the genus are evidently to be met with in the same general region, because the present collection indicates that the genus is equally common in both continents, where its representatives are distributed throughout the tropical and warmer parts of the temperate zones.

***Tettigidea imperfecta* Bruner.**

*Tettigidea imperfecta* BRUNER, Journ. N. Y. Ent. Soc., XIV, 1906, 147.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 68.

*Habitat.*—Island of Trinidad, off the coast of Venezuela, South America.

***Tettigidea cuspidata* Scudder.**

*Tettigidea cuspidata* SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, 1874-1875, 31-32.—BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 296.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 68.

*Habitat.*—Peruvian Andes, South America.

***Tettigidea planus* Hancock.**

*Tettigidea planus* HANCOCK, Trans. Ent. Soc. Lond., Sept., 1907, 243-244.

*Habitat.*—This species has been reported but once. It comes from Paramba, Ecuador, and tends to show that representatives of the genus are to be found across the South American continent from the Andes to the Atlantic.

***Tettigidea gracilicornis* sp. nov.**

Comparatively robust with abbreviated pronotum and wings, but with very long and slender antennæ. A species above the medium in size and approaching *Batrachidea* in the vertex and pronotal structures.



Head with the summit comparatively plane and depressed below the prominent subglobular eyes, the surface sparsely granulose, only about two-thirds the width of one of the eyes; the vertex not advanced in front of the eyes and with the lateral carinæ abbreviated and inconspicuous; frontal costa rather profoundly sulcate nearly to the very top, the upper end of the costa not following the median sulcus of the summit of the head towards the occiput. Antennæ long and slender, nearly or quite as long as the hind femora. Pronotum finely granulate, only gently tectate, the median carina slender but quite prominent, viewed laterally gently undulate a trifle ascending just before the front edge, which is angulated at middle and terminates in an acute downwardly curved spine; the apex or hind border bluntly acuminate, not quite reaching the tip of the abdomen in either sex. Tegmina small, oblong, wings very abbreviate or entirely wanting. Hind femora rather robust and passing the tip of the abdomen in both sexes.

Dark mahogany brown above, in some specimens with darker mottlings on the carinæ and disk of pronotum. Face, cheeks, and lower lateral edges of pronotum obliquely testaceous. Pleura, sides of abdomen and hind femora both interiorly and exteriorly fuscous varied with irregular paler markings, the tibiæ and tarsi annulate. Tegmina of males and some of the females provided near the apex with a small testaceous or flavous circular spot. Underside of male abdomen dirty white, the pectus marked as in *T. hancocki*, in the female the meso- and metasternum black.

Length of body, ♂, 7.5 mm., ♀, 10 mm.; of pronotum, ♂, 6.5 mm., ♀, 8.5 mm.; of hind femora, ♂, 5.25 mm., ♀, 7.5 mm.

*Habitat*.—Para and Rio de Janeiro, Brazil, during September. Also at Chapada during the months of March, April, August, and November. Both sexes taken by H. H. Smith. Carnegie Museum, Pittsburgh.

Possibly this insect should be referred to the genus *Batrachidea*, in which case it would come closest to the species *B. mucronata* of Serville, which has the pronotum much longer and in some instances has the wings even exceeding the pronotum in length.

#### *Tettigidea pulchella* Rehn.

*Tettigidea pulchella* REHN, Proc. Acad. Nat. Sci. Phila., 1904, 669.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 68.

*Habitat*.—British Guiana.

*Tettigidea chapadensis* sp. nov.

A medium sized, rather slender; dark-colored insect, in which the pronotum is destitute of supplemental carinæ and extends considerably beyond the apex of the abdomen and tip of hind femora in both sexes. Tegmina provided with an oblique subapical flavous patch.

Head small, rather deeply sunken into the front edge of the pronotum, the vertex a little advanced beyond the eyes. the transverse carinæ blunt and inconspicuous: frontal costa fairly prominent and profoundly sulcate nearly to the upper extremity, viewed laterally broadly and evenly rounded to the ocellus. Antennæ slender, of moderate length, situated just within a line drawn from the lower edge of the eyes. Top of head between the eyes but gently undulate, only slightly granulated. Pronotum long and slender, anteriorly angulate and provided with a slender spine that reaches to the middle of the upper edge of the fairly prominent eyes; disk finely granulate and furnished with irregular, fine rugæ and lines which are inclined to run lengthwise, especially on its widest part; the median carina is slender, straight, and most prominent anteriorly; lateral carinæ in front also slender, reaching the transverse sulcus, beyond the interruption nearly as prominent as the median. Legs slender, the hind femora extending beyond the tip of the abdomen in both sexes. Tegmina moderately large, elongate oval or sub-spatulate, rather smooth; wings fully developed and extending considerably beyond the tip of the pronotum in both sexes.

General color above brownish, fuscous, or black, very seldom dull ferruginous; below pallid, anterior and middle femora pallid, the tibiæ and sometimes the hind femora of the females maculate with testaceous: face. lower part of cheeks, lower edges of pronotum obliquely, base of hind femora, the tibiæ, and under side generally flavous or dull testaceous. Sides of abdomen also more or less vittate with pallid. The paler colored females, and occasionally the darker ones, show a tendency towards having the hind femora marked externally with a rather large pallid patch.

Length of body, ♂, 6.35 mm., ♀, 10 mm.: of pronotum, ♂, 9 mm., ♀, 11 mm.; of hind femora, ♂, 5 mm., ♀, 7 mm.

*Habitat*.—Chapada, near Cuyaba, Matto Grosso, Brazil, and also Corumba and Para, Brazil. Collected at various times from September to April by H. H. Smith. Carnegie Museum, Pittsburgh.

The species is represented by several specimens of both sexes. As may be observed by a reference to the accompanying synoptical table of

the species of the genus this insect is related to both *pulchella* Rehn and *trinitatis* Bruner.

***Tettigidea trinitatis* Bruner.**

*Tettigidea trinitatis* BRUNER, Journ. N. Y. Ent. Soc., XIV, 1906, 147.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 68.

*Habitat*.—Island of Trinidad.

If the *Tetrix purpurascens* of Serville (Ann. Soc. Nat., XX, p. 291) proves to be a *Tettigidea* it will be found to closely resemble the present species, if it is not the same. It too comes from Trinidad.

***Tettigidea hancocki* sp. nov.**

A large but slender insect with small head, coarsely rugose but glabrous spicate and longly attenuate pronotum and slender hind femora, reminding one at first glance of *Tettigidea lateralis* Say, and its near allies of North America.

Head of moderate size, the eyes rather prominent, vertex somewhat but angulately advanced in front of the eyes, the occipital carinæ or rugæ uniting with the oblique prominent lateral carinæ of the front which reach the eyes; frontal costa broad, not prominent, the upper extremity nearly filling the longitudinal sulcus of the head between the eyes, sulcate from a point a little above the ocelli; outer joints of the palpi gently spatulate, not strongly or noticeably sulcate. Pronotum attenuate and uncinatè, the dorsum gently rounded, rugose, the median carina coarse but not prominent, in no part arcuate, the prominent rugæ tending to form one or two longitudinal ridges on each side between and for some distance back of the humeri. Hind femora adorned above and on outer face with comparatively few but prominent smooth elevations. Hind tarsi long and slender, the third joint noticeably longer than the first. Wings greatly surpassing the tips of the hind femora and the apex of the pronotum.

General color of the pronotum above brownish testaceous, at the sides piccos; sides of abdomen, pleura and most of pectus fuscous, the latter provided in the center and laterally with raised, roughened, leaf-like testaceous patches. Legs without definite traces of annulation or maculation, the abdomen and femora below and the tibie becoming paler.

Length of body, ♂, 10.25 mm.; of pronotum, 11.5 mm.; to tip of wings, 15 mm., of hind femora, 6 mm.

*Habitat*.—Corumba, Brazil, on highlands, a single male, collected in March by H. H. Smith. Carnegie Museum, Pittsburgh.

**Tettigidea australis** sp. nov.

A small species with attenuate pronotum in which the dorsum of this portion is coarsely granulate and shows definite traces of longitudinal supplemental carinae both in front and between the humeri, formed chiefly by the alignment of some of the granulations.

Head nearly normal, or possibly a trifle high, the front somewhat oblique; eyes large, a little prominent; the top of the head only moderately deeply sulcate and furnished with blunt longitudinal rugae, the vertex slightly advanced in front of the eyes, the lateral carinae strong and gently arcuate, almost touching the upper carina of frontal costa; the latter not prominent, profoundly sulcate and continued above nearly to a point opposite the middle of the eyes; antennae located just within a line drawn between the lower edges of the eyes. Pronotum moderately slender, its anterior edge angulate and spined at middle, the posterior portion reaching the tips of the hind femora. Tegmina small, the disk sparsely granulose, the granules arranged into irregular rows. Hind thighs somewhat robust, the carinae strong but the general surface not especially rough.

General color brownish testaceous above, at the sides varied with piceous and fuscous; face, cheeks, lower lateral edges of the pronotum, and underside dull testaceous; tegmina immaculate, fuscous; hind femora and sides of abdomen fuscous somewhat mottled and varied with testaceous, anterior and middle legs very faintly annulate.

Length of body, ♂, 7 mm.; of pronotum, 8 mm.; of hind femora, 4.6 mm.; total length to tip of wings, 9.85 mm.

*Habitat*.—Chapada, near Cuyaba, Matto Grosso, Brazil, a single male, collected by H. H. Smith during the month of April. Carnegie Museum, Pittsburgh.

Only for the presence of the spine on the anterior edge of the pronotum this insect would remind one strongly of a diminutive *T. lateralis* and a couple of its North American allies.

**Tettigidea intermedia** sp. nov.

Slightly below the medium in size and somewhat closely related to *chapadensis*, from which it differs most markedly in the glossy and more robust form, the more nearly equal size of the sexes, and the different structure of the summit of the head, the vertex and frontal costa.

Head normal, the summit depressed a little below the eyes, the sulcus and longitudinal rugae inconspicuous, the latter granulose; the vertex

gently and roundly advanced in front of the eyes, the oblique carinæ blunt; frontal costa only moderately prominent, slender and low above, widening below, the narrow sulcation beginning midway between the summit and ocelli with the walls coarse, whereas in *chapadensis* the rather broad sulcation begins near the summit, and has the walls fine. Pronotum rather broad, roundly arched transversely between the shoulders; the anterior edge angulate, spined, hind edge wedge-shaped, reaching the tip of the abdomen; median carina rather prominent and a little arcuate in front, straight or gently undulate behind, the surface both rugose and granulose with indications of accessory carinæ on the disk; sides of pronotum in advance of the humeri with glabrous patches. Hind femora robust, the pinnæ regular.

General color brownish ferrugineous varied with fuscous and piceous above, on the sides piceous or fuscous, the males darker with paler face; cheeks and lower lateral anterior edges of pronotum testaceous. Hind femora mottled with testaceous; anterior and middle legs dimly annulate with fuscous. Underside testaceous. Tegmina immaculate, but with the lower edge a little pallid.

Length of body, ♂, 8.25 mm., ♀, 11 mm.; of pronotum, ♂, 7 mm., ♀, 9.35 mm.; to tip of wings, ♂, 11 mm., ♀, 12.5 mm.; of hind femora, ♂, 5.2 mm., ♀, 6.5 mm.

*Habitat*.—One male and two female specimens collected from April to November by H. H. Smith. Chapada, near Cuyaba, Matto Grosso, Brazil. Carnegie Museum, Pittsburgh.

#### ***Tettigidea costalis* sp. nov.**

About the size and form of *T. lateralis* of middle North America, but at once separable from it by the presence of a spine on the anterior margin of the pronotum above, by the narrower and less projecting vertex, by the deeper and coarser median longitudinal sulcus and prominent granulated ridges on top of the head, by the less coarse and less prominent frontal costa and the more ampliate terminal joint of the palpi. *T. costalis* may also be known by the more prominent supplemental longitudinal carinæ of the pronotum, which are only two in number on each side, straight, parallel, continuing to a point almost opposite the middle of the hind femora. The tegmina of *costalis* are somewhat smaller and less definitely marked than in *lateralis* and its North American allies, while the spines on the hind tibiæ are smaller and fewer in number.

The general color of the only specimen at hand is dull brownish testa-

ceous with a trace of piceous along the sides immediately below the lateral carinae of the pronotum. The hind femora also show traces of darker mottlings, while the anterior and middle tibiae are faintly fasciate. The face, cheeks and lower anterior edges of the pronotum are not especially pallid as in the same sex of *lateralis*.

Length of body, ♂, 8.5 mm.; of pronotum, 10.5 mm.; to tip of wings, 12.25 mm.; of hind femora, 5.85 mm.

*Habitat*.—A single male, taken by H. H. Smith at Chapada, Brazil, in September. Carnegie Museum, Pittsburgh.

#### ***Tettigidea subaptera* sp. nov.**

An insect below the medium in size and with abbreviated pronotum and wings, reminding one at first sight of some of the short-winged North American species. Anterior edge of the pronotum angulate and uncinata at tip, the disk provided with longitudinal supplementary carinae. Hind femora comparatively robust and short. Head and body somewhat coarsely granulated.

Head rather small, deeply set into the front edge of the pronotum, the vertex gently advanced beyond the eyes, rounded or subangulate, the sides well carinated and the top of the head provided with deep, coarse longitudinal sulci and rounded ridges that reach from the pronotum to the carina of front edge; frontal costa prominent, viewed laterally widely bowed between the antennae, narrowly sulcate, the walls coarse and granulated internally. Antennae short, situated on a level with the lower edge of the prominent eyes. Pronotum in both sexes not quite reaching the apex of the abdomen, median carina coarse and somewhat prominent but not arcuate, the lateral carinae also prominent but interrupted for a short distance back of the first transverse groove, the supplemental carinae of the disk, two or three on each side, not much broken. Tegmina immaculate, of medium size, the lower edge broadly rounded and comparatively smooth; wings usually rudimentary, in no case reaching the tip of the pronotum. Hind femora robust, comparatively smooth, extending nearly or quite one-third of their length beyond the apex of the abdomen.

General color variable above, in some specimens pale testaceous varied with fuscous, in others nearly uniformly dark fuscous, below testaceous. Males with the face and lower cheeks as well as the under side and lower edge of femora pale testaceous; the tibiae and tarsi and sometimes the femora of both sexes fasciate or blotched with the pale shades. Outer joints of the palpi very broad, dirty white.

Length of body, ♂, 7.5 mm., ♀, 9 mm.; of pronotum, ♂, 6 mm., ♀ 8.5 mm.; of hind femora, ♂, 4.65 mm., ♀, 7 mm.

*Habitat*.—Chapada, Brazil, a number of specimens of both sexes, collected by H. H. Smith from April to July. Carnegie Museum, Pittsburgh.

***Tettigidea arcuata* sp. nov.**

A moderately robust insect, a little above the medium in size and with the apex of the tectate pronotum just about reaching the tips of the hind femora in the typical form.

Median carina very prominent, evenly arcuate and accompanied by two or three well-defined supplemental carinæ on each side of the disk. Body and legs granulose, the surface for the most part glabrous. The sexes not greatly differing in size.

Head large, considerably higher than wide, deeply set into the front edge of the pronotum; vertex very slightly advanced beyond the eyes, the lateral carinæ well-defined, a little coarse; the occiput or summit of the head profoundly grooved and ridged; frontal costa very prominent, deeply but narrowly sulcate, continued caudad above to a point midway between the eyes; antennæ short and coarse, situated on a line with the lower edge of the eyes, the latter of fair size but not prominent. Pronotum tectate anteriorly, variable in length but usually reaching the tip of the hind femora in both sexes, its anterior edge angulate and advanced upon the occiput, where its apex terminates in a short but acuminate tooth that nearly reaches the posterior limitation of the frontal costa; lateral carinæ in front interrupted by the first transverse sulcus but insensibly merging with the outer one of the supplemental or discal series, which latter extend to opposite the apex of the tegmina; the latter rather large, broadly rounded below, carinated above, immaculate but with the lower margin paler than the disk and upper area. Legs robust, especially the femora, the hind pair of which are nearly two-fifths as broad in their widest place as long, the pinnae of outer disk distinct and regular but not prominent. Wings in the typical form considerably surpassing the apex of the pronotum, in the brachypterous form sometimes only half as long.

General color above varying from pale brownish testaceous to fuscous and in some specimens showing mottlings of light and dark tints on the pronotum and hind femora. Lower side paler but not so apparent as in the males of several other species, as for example *subaptera*, *chapadensis*, and *pulchella*. Tibiæ and tarsi of anterior and middle legs usually conspicuously annulated with testaceous and fuscous.

Length of body, ♂, 9.5 mm., ♀, 12 mm.; of pronotum, ♂, 9 mm., ♀, 11.5 mm.; of hind femora, ♂, 6 mm., ♀, 7 mm.; length to tip of wings, ♂, 12.5 mm., ♀, 14.75 mm.

*Habitat*.—A considerable series of both sexes taken at Chapada, Brazil, during the months of April, May and June, H. H. Smith collector. Carnegie Museum, Pittsburgh.

#### ***Tettigidea multicostata* Bolivar.**

*Tettigidea multicostata* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 299.—BRUNER, Locusts of Argentina, 1900, 17; Proc. U. S. Nat. Mus., XXX, 1906, 616.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 68.

*Habitat*.—Brazil, Paraguay, Bolivia, and northern Argentina. Corumba, Brazil, and Paraguay. Carnegie Museum, Pittsburgh.

While this insect is quite widely distributed over several South American countries it does not appear to vary much in pronotal length or size. On the other hand it is quite markedly variable in the prominence of the supplemental longitudinal carinae of the disk of the pronotum and in its coloration.

#### ***Tettigidea corrugata* sp. nov.**

A large, robust species with coarse hind femora and abbreviated pronotum and wings in which there are present on the disk of the former a number of supplemental, longitudinal carinae, and where the median carina is very prominent, coarse, and evenly arcuate.

Head very deeply sunken into the front edge of the pronotum, the occiput being completely hidden by the strongly angulate anterior portion of its dorsum; eyes rather small, not prominent; vertex well advanced in front of the eyes, the lateral or transverse carinae coarse and prominent; frontal costa also coarse and prominent, narrowly sulcate but with heavy lateral walls, originating above opposite the middle of the eyes in a fairly deep sulcus between two coarse longitudinal granulated ridges. Antennae filiform, of moderate length. Pronotum abbreviated tectate, granulose, the median carina prominent, coarse, arcuate, lateral carinae scarcely interrupted, sinuose in advance of the shoulders, the disk provided with rather prominent supplemental carinae which are present even in advance of the transverse sulci; anterior edge forming nearly a right angle and ending in a prominent spine that projects slightly beyond the upper part of the frontal costa. Hind femora robust, rugose, extending a trifle beyond the tip of the ovipositor, the valves of which are rather long and slender. Tegmina small, elongate, unicolorous.



General color brownish testaceous obscurely varied with darker blotches, especially above and on the hind femora. Anterior and middle tibiæ obscurely annulate.

Length of body, ♀, 15.5 mm.; of pronotum, 13 mm.; of hind femora, 9.5 mm.

*Habitat*—Three females, Chapada, Matto Grosso, Brazil, October to January, H. H. Smith collector. Carnegie Museum, Pittsburgh.

This insect is very similar to *multicostata* Bolivar from the same locality, but much larger and coarser.

#### LOPHOTETTIX gen. nov.

Related to *Tetrix* in the form of the vertex and to *Tettigidea* in having the anterior femora plainly sulcate above. It differs from the former in the elongate antennæ, the presence on the pronotum above of several strongly developed uninterrupted supplemental carinæ, and in the elongate, robust, but comparatively smooth hind femora, and from the latter as described in the synoptic table on page 92.

Head of moderate size, wider below than above; the eyes not prominent, subglobular, separated above by a gently depressed space about equal to the diameter of one of them; the vertex subangulate, advanced somewhat in front of the eyes, the lateral carinæ strong; top of the head between the eyes broadly and shallowly longitudinally canaliculate at the sides, the surface decidedly granulose. Frontal costa moderately prominent, above and between the antennæ, narrowly sulcate nearly to the upper extremity. Posterior ocelli situated between the middle of the eyes. Antennæ long, filiform, composed of about 20 joints, located between the lower extremity of the eyes or a trifle below them. Pronotum elongate, rounded, not angulate at the shoulders or sides: the anterior edge angulately produced upon the occiput; transverse sulci scarcely apparent, the posterior extremity attenuate. Tegmina oblong, their apex rounded. Wings fully developed, reaching the tip of the pronotum or beyond. Legs smooth, the anterior and middle ones in nowise clypeate but plainly sulcate above; the hind femora robust, elongate, smooth. First and third joints of hind tarsi subequal, the first possibly a trifle the shorter; hind tibiæ somewhat dilated apically, the spines well defined.

#### *Lophotettix lineatus* sp. nov.

Entire insect quite closely and finely granulose. The dorsum of the pronotum provided on each side of the disk with two or three longitudinal

supplemental carinae, as found in several species of the nearly related genus *Tettigidea* coming from the same general region. Anterior to the transverse sulci only a single one of these supplemental carinae is present, while between the humeri two and sometimes even a third are found. Lower posterior angles somewhat acute and turned down.

General color variable, ranging from dull testaceous to dark fuscous or dull black, the sides or deflexed lobes of the pronotum obliquely pallid, the femora and tibiae together with the tarsi strongly fasciate with testaceous and fuscous. Tegmina usually unicolorous but in some specimens marked apically with a minute smooth pallid spot. Under surface of the body pale testaceous or dirty yellowish white.

Length of body, ♀, 7.75–8.25 mm.; of pronotum, 9.75 mm.; to tip of wings, 11 mm.; of hind femora, 5.25 mm.

*Habitat*.—Chapada, Brazil, four female specimens taken by H. H. Smith during the months of April, May, and June. The type is in the Carnegie Museum, Pittsburgh.

#### LOPHOSCIRTUS gen. nov.

Related to both *Tettigidea* and *Batrachidea*, from which genera its members differ chiefly in the characters of the vertex and frontal costa. General form slender.

Top of head gently depressed, usually as wide as or a little wider than the diameter of one of the not very prominent eyes; the vertex viewed laterally considerably advanced beyond the anterior margin of the eyes, from above broadly rounded, its middle somewhat emarginate, the antero-lateral carinae prominent, continued to and bent to the rear along the inner edges of the eyes; median carina very prominent and high, forming an arcuate crown in continuation with the prominent frontal costa, the latter narrowly but deeply sulcate to its very summit. Antennae short, 15- or 16-jointed, located between the middle of the lower half of the eyes; lateral ocelli small and situated just above the middle of the eyes. Maxillary palpi with the two terminal joints greatly flattened and enlarged,—pallid and therefore very prominent. Pronotum elongate, narrow, the anterior margin angulate and extending forward upon the occiput at middle, where it terminates in a strong spine; lateral carinae very prominent in advance of the transverse sulcus, median carina also quite prominent throughout, the dorsum furnished with a series of continuous supplementary carinae. Tegmina of moderate size, elongate, narrow. Anterior and middle femora slender, plainly sulcate, their carinae in no wise undulate or clypeate; hind femora also slender, comparatively smooth, the upper carina ter-

minating in a pregenicular tooth, the apex at center also provided with a prominent tooth; hind tibiæ somewhat enlarged apically, provided with about six moderately strong spines externally and seven internally; first joint of the hind tarsi as long as the second and third combined. Valves of the ovipositor acuminate, very long and straight, the upper ones moderately heavy, serrate above; the lower pair much shorter and slenderer, their inferior margin nearly smooth.

**Lophoscirtus gracilis** Bruner.

*Tettigidea gracilis* BRUNER, Locusts of Argentina, 1900, 17; Proc. U. S. Nat. Mus., XXX, 1906, 616.

*Habitat*.—The only specimen of this species known to the writer, the type, was collected on a river steamer near the borders of Paraguay. It is in his collection.

Genus **PLECTRONOTUS** Morse.

*Plectronotus* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 14.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 69.

While we have no reference of any representative of this genus having been discovered in South American territory it is quite as likely to occur there as in Costa Rica, from which country the only described species is known.

**Plectronotus scaber** Morse.

*Plectronotus scaber* MORSE, Biol. Centr.-Am., Orthopt., II, 1900, 14, fig.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 69.

*Habitat*.—So far only reported from Costa Rica, Central America.

**APTEROPEDON** gen. nov.

Related to both *Batrachidea* and *Tettigidea*, but falling in that section of Hancock's synoptic table of genera "With the frontal costa very narrowly sulcate" 7. (10), although the body is quite large and robust.

Body entirely apterous. the posterior sinus of the lateral lobes of the pronotum wanting. Head large, set into the front edge of the pronotum to the eyes and covered above by the prominent and angulate front edge of the pronotum, the spine of which extends forward nearly or quite as far as the front edge of the fairly prominent eyes. Vertex a little wider than one of the eyes, provided at the sides with inconspicuous indications of carinæ; the median carina present only as a starting point for the fairly prominent frontal costa, which is narrowly but deeply sulcate. Ocelli opposite the middle of the eyes; the antennæ, which are long and slender, inserted barely below their lower edge, and composed of 17 or 18 joints,

the apical 5 or 6 of which are pallid. Posterior femora large and coarse, projecting slightly beyond the tip of the abdomen. Hind tibiæ heavily spined. Valves of the ovipositor slender and quite conspicuously toothed.

**Apteropedon apicale** sp. nov.

Quite uniformly fuliginous save at the edges posteriorly and the apex of the pronotum, where it fades into ferruginous, the venter testaceous, as are the tips of the antennæ. Pronotum rugosely granulate, its median carina very prominent subcristate and evenly arched anteriorly. The lateral carinæ nearly continuous, slender and beaded. First and third joints of hind tarsi about equal in length.

Length of body, ♀, 15 mm.; of pronotum, 13 mm.; of hind femora, 9.35 mm.; of antennæ, 6.25 mm.

*Habitat*.—Two females, Rio de Janeiro, October. Carnegie Museum, Pittsburgh.

Genus **SCARIA** Bolivar.

*Scaria* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 301.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 69.

The genus *Scaria* appears to be confined to the extreme southern parts of North America and to the South American continent, where it is represented by at least four distinct species. These may be separated by the following synoptic table:

- A. Apex of elytra flavo-maculate.
  - b. Sides striated with black ..... *hamata* De Geer.
  - bb. Sides not striated with black..... *producta* Hancock.
- AA. Tegmina not flavo-maculate.
  - b. Dorsum of pronotum furnished with a pallid median line; length of body, ♂ ♀, 8-10 mm..... *lineata* Bolivar.
  - bb. Dorsum of pronotum at middle ornamented with an oblong ferruginous macula; length of body, ♂ ♀, 9-11.5 mm..... *maculata* Giglio-Tos.

**Scaria hamata** (De Geer).

*Acrydium hamatum* DE GEER, Mem., III, 1773, 593, 22, pl. 42, fig. 13.

*Tettix hamatus* STÅL. Recens. Orthopt., I, 1873, 146.

*Scaria hamata* BOLIVAR, Ann. Soc. Ent. Belg. XXXI, 1887, 301.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 69.

*Habitat*.—Guiana, Upper Amazon, Nicaragua, etc. Not among the material now being studied.

**Scaria producta** Hancock.

*Scaria producta* HANCOCK, Genera Insectorum, fasc. 48, 1906, 70.

*Habitat*.—Peru, S. America, Para and Santarem. Collection Carnegie Museum, Pittsburgh.

**Scaria lineata** Bolivar.

*Scaria lineata* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 302.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 69.

*Habitat*.—Upper Amazon.

Not contained in the Carnegie Museum collection now being reported upon.

**Scaria maculata** Giglio-Tos.

*Scaria maculata* GIGLIO-TOS, Boll. Mus. Zool. Anat. Comp. Torin, XIII, no. 311, 1898, 35-36.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 70.

*Habitat*.—Ecuador.

Genus **BATRACHIDEA** Serville.

*Batrachidea* SERVILLE, Hist. Nat. Ins. Orthopt., 1839, 764.—BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 126.—Not the genus *Batrachidea* as meant by Scudder, Thomas, or Saussure.

This is a South American genus that extends northward to the West Indies and possibly also into the southern portions of Central America. Only three species have thus far been described. They may be separated as follows:

- A. Tegmina never with more than a minute or indistinct subapical pallid spot, sometimes entirely fuscous . . . . . *mucronata* Serville.
- AA. Tegmina provided with a large and very distinct subapical macula.
  - b. The macula or tegmina large, rotund, flavous. . . . . *flavo-notata* Bolivar.
  - bb. The macula on tegmina oval, ivory-white. . . . . *notata* Hancock.

**Batrachidea mucronata** Serville.

*Tetrix (Batrachidea) mucronata* SERVILLE, Hist. Ins. Orthopt., 1839, 764.

*Tetrix mucronata* SERVILLE, Encycl. Méth., X, 1839, 600.

*Acridium (Tetrix) mucronatum* DE HAAN, Bjdrag. tot de Kennis Orthopt., 1842, 166.

*Batrachidea mucronata* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 300.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 70.

*Habitat*.—Brazil, Peru. Carnegie Museum, Pittsburgh.

In the present collection there are four specimens which are referred here with some doubt, since the frontal costa is decidedly widely furcillate instead of narrowly so, as described in the generic diagnosis given by Hancock in his Genera Insectorum article. Aside from this character, however, it is a typical *Batrachidea*. These specimens come from Chapada, Brazil, where they were taken during August and October. Both sexes are represented.

**Batrachidea flavo-notata** Bolivar.

*Batrachidea flavo-notata* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 300.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 70.

*Habitat*.—New Granada, Colombia.

Not contained in the present collection.

#### **Batrachidea notata** Hancock.

*Batrachidea notata* HANCOCK, in BRUNER, Proc. U. S. Nat. Mus., XXX, 1906, 616-617.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 70.

*Habitat*.—Sapucay, Paraguay.

There are two females at hand that were collected, the one in Paraguay and the other at Chapada, near Cuyaba, Matto Grosso, Brazil. The former was taken in December and the latter in July. They both have the wings considerably longer than the pronotal process, which itself passes the apex of the hind femora nearly two millimeters. Carnegie Museum, Pittsburgh.

#### Genus **PAUROTARSUS** Hancock.

*Paurotarsus* HANCOCK, Psyche, IX, 1900, 42; Genera Insectorum, fasc. 48, 1906, 70-71.

The genus *Paurotarsus* so far as at present known is confined to tropical South America and the adjoining island of Trinidad. Only two species have been described. The subjoined table will separate them.

- |     |  |                          |
|-----|--|--------------------------|
| A.  | Carinae of the frontal costa very heavy, almost obliterating the otherwise moderately wide sulcus; dorsum of the pronotum anteriorly gently arcuate (Brazil).....              | <i>amazonus</i> Hancock. |
| AA. | Carinae of the frontal costa only moderately heavy, leaving the sulcus fairly wide; dorsum of the pronotum anteriorly strongly arcuate (island of Trinidad, West Indies) ..... | <i>rugosus</i> Bruner.   |

#### **Paurotarsus amazonus** Hancock.

*Paurotarsus amazonus* HANCOCK, Psyche, IX, 1900, 42-43, figs. 1a-1d; Genera Insectorum, fasc. 48, 1906, 71, fig. 26.

*Habitat*.—Amazon, South America.

The H. H. Smith collection contains specimens of what I take to be this species. They were taken at Para and Santarem, Brazil. Those from the former locality were captured during the month of July. Carnegie Museum, Pittsburgh.

#### **Paurotarsus rugosus** Bruner.

*Paurotarsus rugosus* BRUNER, Journ. N. Y. Ent. Soc. XIV, 1906, 148.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 71.

*Habitat*.—The types (♂ and ♀), which are in the writer's collection, come from the island of Trinidad.

## Genus PUIGGARIA Bolivar.

*Puiggaria* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 301-302.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 71-72.

This is a South American genus related to *Batrachidea*, *Scaria*, etc., and contains only a single tropical species.

***Puiggaria antennata* Bolivar.**

*Puiggaria antennata* BOLIVAR, Ann. Soc. Ent. Belg., XXXI, 1887, 302-303, pl. 2, figs. 26, 26a-26b.—HANCOCK, Genera Insectorum, fasc. 48, 1906, 72, fig. 27.

*Habitat*.—Aphiahy, Brazil.

This insect is not contained in the collection being reported upon, unless the four specimens referred to as doubtfully belonging to *Batrachidea mucronata* (Serville) are the present species. Should this latter surmise prove correct, then the genus *Puiggaria* must precede *Paurotarsus* and the diagnosis changed so as to include perfectly developed winged forms as well as those with these organs greatly abbreviated.

